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THE NEW SCIENCE

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The New Science

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The Foundations of Holist Science

by

Jim Schofield



Having finally buried The Copenhagen Interpretation of Quantum Theory, both philosophically and physically, the time has come for establishing the Revolutionary Alternative, namely *Holist Science*

It is not entirely new, but does need to be firmly established among the wreckage of the Copenhagen defeat, to re-orientate the Scientific Experimental Method on Holist rather than Pluralist grounds, to re-construct the most basic of the sciences, Sub Atomic Physics, beyond the limits imposed upon it by Copenhagen, and to begin the reunion of all-the-sciences upon a common, coherent, consistent and comprehensive ground - always promised but never delivered, throughout the millennia of Pluralist Science, and its ever-increasing dominance of Form over Content.

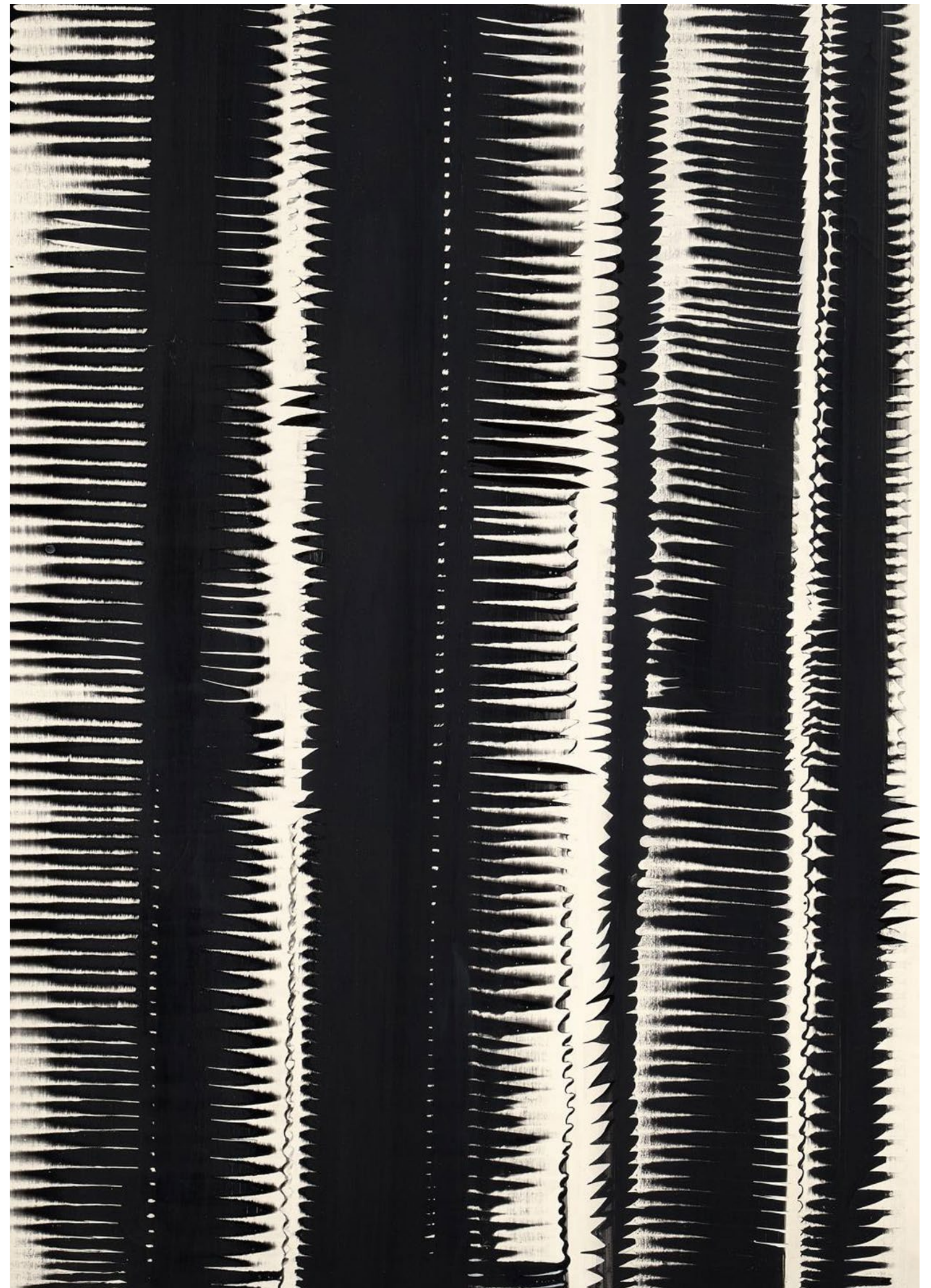
There have been isolated interludes in the past within other, assumed-to-be-secondary sciences, such as Biology, Geology, and even Astrophysics, but the concreted-in Pluralist Foundations of the majority of sciences and specialisms, have always turned attention away from Explanation to Effective Production - from True Science to Technology - with an all-embracing emphasis upon

usable Mathematics and Equations, rather than the building of Real and General Understanding.

The problems were originally totally unavoidable due to Mankind's origins as a remarkably intelligent Ape. But, even thereafter, Man's slowly-changing abilities were still merely those of an exceptional Ape, and only equipped him to be an excellent, ground-dwelling, bipedal Hunter/Gatherer, and certainly not yet a Thinker.

For several million years, as a member of, first the Australopithecus genus and then of the Homo genus, their greatest intellectual achievement was still only, "If it works, it is right!" or Pragmatism. Even finally as a Homo sapiens, or modern humans as we now call them, they made very small developments until 20,000 years ago, when they experienced the Neolithic Revolution and changed their lifestyle completely.

The tempo of real qualitative change has always been deadly slow - so much so, that any "natural records" left behind, show all such significant qualitative revolutions - or Emergences, as mere step-changes, and hence totally unanalysable by the usual methods.





Indeed, the justifiably-lauded achievements of the Ancient Greeks, did not stop them making the same understandable errors, and, having created Mathematics, extrapolated its wholly pluralist stance, illegitimately, into, first, Formal Logic and thereafter, the beginnings of Science.

And, in spite of Zeno's limited criticisms in his Paradoxes, no systematic exposure of the involved errors in General Reasoning were made for a further 2,300 years with the damning revelations by Hegel in his Thinking about Thought researches.

So, in spite of the significant gains made in Science in the couple of millennia prior to Hegel, there was NO revolution in Science, for Hegel was an idealist, and his Dialectical Materialist follower Karl Marx, was no scientist either. Indeed, nothing has been done on Science's foundations up to the present era!

And, this was the reason for the Major Retrenchment in Sub Atomic Physics, which is known as The Copenhagen Interpretation of Quantum Theory. The amalgam of contradictory stances delivered by the Ancient Greeks, and glued together with the ancient "If it works, it is right!", survived with the same bases, until it began to fall apart of itself.

There were other important reasons that underpinned that survival: and they occurred within the joint disciplines of Mathematics-and-Technology. For, by far the most evident and profitable results of Science, were in the production of both useful and even valuable products, and the main tool in delivering such things was in legitimate uses of Mathematics.

Indeed, what the layman called "Science" was always, in fact, Technology. Real Explanatory Science continued to be pursued, by finding and explaining ever newer phenomena: but, the understanding, so produced, was generally not considered as important as the efficient and regular use of the knowledge revealed in New Products for the market.

Now, the recent demolition of the Copenhagen diversion, has had unavoidable repercussions across the board: a major technology-based culture dominates the current Capitalist World, and not only in Physics, but in ALL other intellectual disciplines, the misleading pluralist version of Formal Reasoning still holds sway, and this too has to be corrected, and that will be no simple switch.

The inclusion of Dialectics as first delivered by Hegel in certain situations, was soon developed into being able to logically understand a temporary balance between opposite tendencies, and even a feel for judging situations liable to change.

Indeed, the most significant development has been *The Theory of Emergences* (2010), and the trajectory of qualitative changes from one "apparently" permanent Stability, via crises and an ultimate terminal collapse, to lead to the establishment of a wholly new Stability at another level.

As will be seen in some of the papers included in this set, there is a beginning of new holistic methods of handling changing situations and becoming familiar with the new Logic of Change - or as Hegel liked to call it - The Science of Logic!

What is Holism?

Originally, historically and now!

Holism might not be what you think it is. The word has an important philosophical meaning which has been lost in its many recent misuses.

Around 500 BC, two contradictory basic premises were originally defined, which have both proved to be absolutely essential to the consequent development of Mankind. And, both of these were so empowering that each one's opposite wasn't even considered worthy of further study, for they appeared to be completely mutually-exclusive, and couldn't both be true. So, though they both came to light at about the same time, in the particular area where each one was first defined, the other was never considered seriously thereafter.

So, each developed in its own geographical area and became the most important rock upon which future intellectual reasoning about the World was thereafter erected. Perhaps surprisingly, as soon as they were realised, any overtly-conscious awareness of them, as crucial foundations of all that followed, was almost immediately lost! They were never, thereafter, considered as crucial, man-devised premises, but just "the way that the World is!".

Let me prove this point before I take things any further!

The "western basic premise" as devised in Ancient Greece was Plurality! Yes, Plurality - but, are you clear exactly what it established, and which, ever since, has underlain literally all intellectual developments in the West for the following 2,500 years? Plurality saw Reality as being determined by a set of eternal Natural Laws, which simply summed in various mixes and proportions to deliver everything that there is. The task of studying Reality (in all its diverse forms), therefore, had to be to reveal what these Laws were, and any means that could be used to reveal them more clearly was considered a legitimate method for finding such clearly defining

things. For, as they were eternal, they could not be changed by context. So, if the context was significantly adjusted to most clearly display a given Law, that would in no way change the sought-for Law. Context would still determine what was seen normally, but merely due to the summing of a set of eternal laws in a given set of proportions.

So, let us now consider its supposed opposite - Holism!

This was most carefully defined by The Buddha in India, about the same time as Plurality was being revealed in Greece. And, in a nutshell, it was defined as, "Everything affects everything else" or alternatively as, "Everything is always in constant change!"

You can see how very different this premise made the process of understanding Reality. Instead of the pluralist assumption of the addition of FIXED things, there was instead the holist assumption of the mutually-affecting combination of easily changeable and hence constantly CHANGING components.

It is significant how the same World was seen in such diametrically opposite ways - and with very good reasons. For, though in one sense things did indeed remain basically the same, in another equally valid sense everything was constantly changing, and though mostly imperceptibly, they occasionally also changed in radically and even in cataclysmic ways too!

Interestingly one approach indicated that analysis would reveal the fixed activators of Reality, while the other involved something more like understanding the juggling of constantly changing components. Both were useable, but while one was made possible by rigidly holding many things as still as possible, and, thereafter, mining the fixed laws, the other involved detailed observation of changing things, looking for what were the major determinators



of change and development, and how in a range of circumstances they affected outcomes. One method imposed order and lack of change to find what it sought, while the other was always observing things as they were, and aiming to understand how they developed.

Now, the major emphasis has always been upon the Western Pluralist Tradition for it delivered something that the Eastern Holist Traditions seemed unable to achieve: and that was the production of goods for the market, and hence the fairly rapid accumulation of wealth. This success was assured by Control!

The selective and firm control of a given context allowed the sought-for Laws to be extracted, and though, it turned out, those laws could never be used in Reality-as-is, the same controls exactly as were used in extraction could also be used in production, so in the right context the law could be predictably and effectively used to produce exactly what was intended, in conformity with the “supposed-to-be-eternal” Law.

It didn't matter that the Law wasn't the eternal Natural Law they had supposed it to be: it became such within the rigidly controlled Domains that Man could achieve by his powerful Control of circumstances.

But, it was a pragmatic achievement only!

The so-called “theories” that attempted to explain the fixed Laws employed in particular contexts were inevitably wrong. They didn't explain why the results were as they were: instead they were at best an indissoluble accompanying narrative to a given made-fixed Law only.

Those who correctly saw Theory as capable of being an all-embracing fabric of explanation, and hence allowing the general extension of it to cover all areas of study, were stymied from the outset! They considered that with a set of eternal Natural Laws everything could be explained, but it never worked out that way, because the fixed Laws were fictions, limited to particular, very different, rigidly achieved and controlled non-natural contexts!

Contradictions cropped up all over the place, and a semblance of order was only maintained by an increasing number of so-called Specialist Areas of Study, along with an amazing-and-necessary amalgam of contradictory philosophical stances.

So-called Science was always an amalgam of materialist entities, idealist Mathematics, and the main saver - Pragmatism, or “If it works, it is right!” The smaller contradictions in Formal Logic were easily overcome, by pragmatic “suck-it-and-see” methods, while the major problems necessitated the definition of a distinct specialism, subject or even Science.

But, even so, the overall expanse got increasingly out of hand, until the contradictions became totally untenable, and in Sub Atomic Physics actual Explanatory Physical Theories were totally banned as self-kid, and that area of physics was limited to Equations-plus-Pragmatism, when the so-called Copenhagen Interpretation of Quantum Theory was universally adopted at the Solvay Conference in 1927.

So, what is the solution? The first steps were not within Science, but in academic Philosophy, and instituted by the Idealist philosopher Hegel, as a result of extended studies in his chosen area - Thinking about Thought. Hegel was concerned with The Paradoxes of the ancient Greek Zeno, who, in considering the contradictory pair of concepts Continuity and Discreteness in Movement, had revealed a whole set of different circumstances that could not be solved by means of Formal Logic.

Hegel went further and found many more such Dichotomous Pairs of concepts, and decided to rigorously investigate why they occurred. He was able to show that the problem arose within the assumed premises employed by Formal Reasoning methods, when dealing with such situations. And, his solution was to reveal those premises, and if possible correct the offending ones, or add essential others, which when adhered-to in the reasoning, turned the usual insurmountable Impasse, into a clear fork in the reasoning, which enabled the correct option to be chosen and the impasse transcended.

But, there was more to it even than that! He found that Formal Logic could not ever cope with Qualitative Change: it could deal with ordinary Quantitative Changes as long as the Qualities involved were unchanging, but there was nothing in Formal Reasoning to lead to a change in the qualities produced.

Hegel decided to take Dichotomous Pairs as natural outcomes to certain situations, in which changes in underlying factors could move things so far that the current clearly dominant observed factor would flip from

one of the Pair to the other. In addition, factors, though competing, could also both survive with a particular share of each being maintained. If I have this right, this would amount to the possible range of outcomes in what he called The Interpenetration of Opposites.

My reason for suggesting this is that in my prior work upon competition between multiple chemical processes in water, prior to the actual advent of Living Things, I divided these processes into mutually-conductive and mutually-contending, which had the mutually-conductive processes supporting one another, while the mutually-contending processes were competing for the very same resources. And, in the latter a possible balance between competing processes might be most likely if all other inputs to them were in no mutual competition, so a balance of the two products might be possible.

Now, taking this slightly away from such a situation, other minor-and-different inputs might begin to take the situation towards one of the two extremes, and even cause a significant dominance of one over the other. This investigation was undertaken to consider the immediately pre-life processes on Earth, and is clearly a deeper, developmental version of Holism!

And, it significantly moves away from the initial conceptions of the Buddha to allow two contrasting possibilities. First, the establishment of what we call Stabilities, which allow for Pluralistic conceptions, and Second, the inevitable possibility of the *wholly new* occurring!

Indeed, the two original alternatives of Plurality and Holism, which initially appeared as a Dichotomous Pair of mutually-exclusive opposites, within this new view, become possible phases within natural developments.

With Plurality being close to Reality within Stable Phases. While Holism being closer to Reality outwith such Stabilities. And, the developed version of Holism delivering the interludes of Qualitative Changes and Development.

Of course, this account cannot do justice to what is being claimed generally. But, it can act as an introduction to the developments in Philosophy following Hegel, initiated by the leader of The Young Hegelians, Karl Marx, who transferred Hegel's “Dialectics” wholesale into a Materialist stance, and took the whole discussion into the

context of a Trajectory of Qualitative Changes, occurring in crucial transforming Interludes, which became known as Emergences, though in popular parlance were termed Revolutions.

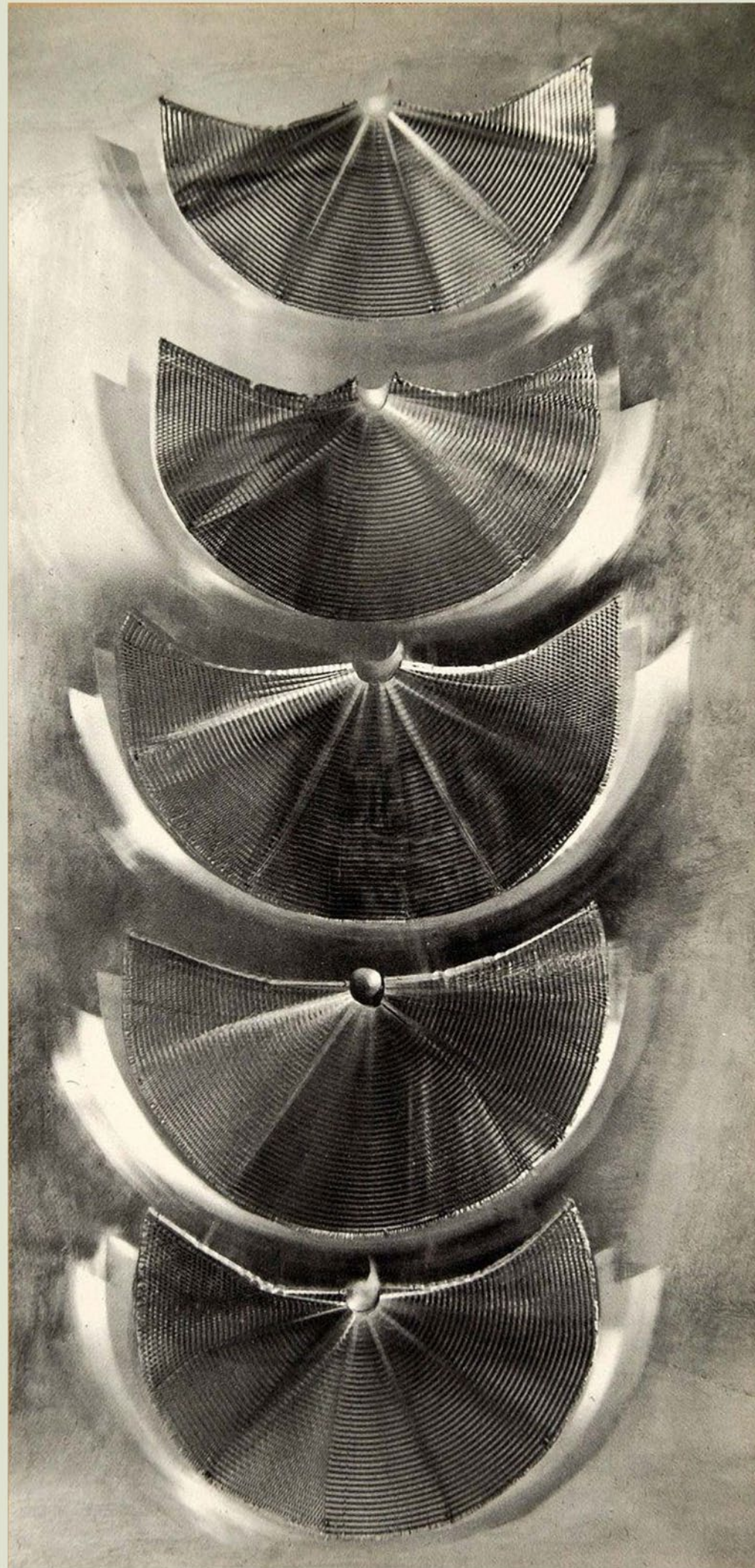
Now, via that route an understanding of the crucial interludes of change has been addressed, and in *The Theory of Emergences* (2010) by the writer of this paper, that development is coming to a powerful fruition.

BUT, what about everyday understanding?

What about Science and Reasoning?

The whole of Science and Technology is STILL dominated by the bankrupt premises and methods referred to here. Not only does the Copenhagen Interpretation of Quantum Theory still dominate Modern Physics, but the old amalgam of contradictory stances still rules literally everywhere else too.

So-called Formal Logic or Reasoning in all fields is still dependant upon The Principle of Plurality, and hence deals only with Stabilities. The task is still to develop new holist ways and means to replace the old tottering system - still largely dependant upon Pragmatism, rather than real Understanding. This theorist is clear what his primary task is - it is to demolish the old conceptions and to begin to build a Holist Approach to Science. But, though this will help, the overall task is much wider and will involve all intellectual disciplines.



Holistic and Pluralistic

Movement

Clearly, the most evident problems in understanding Reality have necessarily been concerned with situations involving either Movement or Qualitative Change, for the real World is most definitely holistic in that everything affects everything else. So, in order to avoid the evident difficulties of this problem, Mankind, after a long relatively successful initial interlude involving only pragmatic approaches to reality, embarked, in addition, upon further methods based upon Plurality - wherein the underlying, determining factors were believed to be eternal Natural Laws.

But, that stance wasn't correct: Reality was much closer to Holism, Laws were NOT fixed and eternal, so something had to be done to take situations closer to the, much easier, pluralist alternative! So, thereafter, to ensure that his assumptions would deliver, he had to modify both all his experimental and all his consequent productive situations, accordingly, so that the exact same version of a chosen Law was effective in both. And the particular arranged-for situation for any particular Law, certainly wouldn't be useful for any other Law: for it would have been necessarily tailored to one-version only of a single Law, though that turned out to be relatively easy to achieve. And, it worked well, both in extracting a version of such a Law, as well as in actually using it.

But, the method also always failed when such outcomes were attempted to be coherently, consistently and comprehensively explained - theoretically! And, this was because the former derivations were always carried out in single constrained sets of circumstances consistent with a carefully arranged-for close-to-pluralist situation - determined primarily by its ability to present a single, particular causal factor very clearly, and also to then allow its easy extraction.

But, it was always only that single, specially arranged-for situation, and different versions, of the "very same"

Law, could occur in many different situations, and a theoretician would want to conquer "all-of-those" in order to use them to explain more complex, multi-factor situations, beyond the single-law-for-use pluralistic achievements. And, these clearly presented a much more difficult situation to explain.

So, to begin to grasp why, we should investigate the easiest ones to expose, which would clearly be the simplest ones involving Movement!

It was in the series of Paradoxes discovered by Zeno of Elea, 2,500 years ago, that the problems were unearthed in situations where the two alternative (and contradictory) concepts of Continuity and Discreteness seemed equally applicable in various situations involving Movement.

But, they never were!

In these circumstances, only one or the other actually delivered, and there was no rule within Formal Reasoning that indicated which one to choose in each situation.

Nevertheless, these are still the best sort of cases to investigate, because it is only movement alone that causes the problem, and not a possible complex cocktail of multiple, mutually-affecting factors, as occur in most situations. The answer will be entirely contained within the effects of movement alone, and how we deal with them!

In Zeno's The Arrow Paradox, dividing the movement of the Arrow into a set of discrete positions may work in some analyses, but it could never explain how the movement, itself, was achieved, for, in any two adjacent positions, the arrow would have to vanish in one position, only to appear "by magic" in the next position to deliver the movement!

Dividing into concrete steps just wouldn't work in explaining movement. You would have to treat it Continuously.

Whereas, in Zeno's race between Achilles and the Tortoise, with the tortoise given a head-start, dividing the sections of the race into subdivisions by when Achilles arrived at where the tortoise used-to-be, the tortoise would always have moved on. So, no matter how many times you repeated this process, Achilles would always fail to catch the tortoise. You could repeat it an infinite number of times and they would still never both be in the same place. So, such a Continuity-based method failed to deliver a solution too! You would have to treat it Discretely in a series of steps.

Neither is the one and only way in all circumstances. Why is this?

Let us see how we would deal with measuring such problems, taking Achilles and the Tortoise first.

Where do we measure-from on Achilles, and where do we measure-to on the Tortoise? We take a single extension-less point on each and measure their reducing separation in terms of that distance: Indeed, when such measurements were attempted in early Astronomy the stars and planets were assumed to be spherical, and their masses were considered as if concentrated at their centres of mass - the dead-centre of the sphere.

Such assumptions make calculations easy, but, nevertheless, the algorithm outlined above would still be infinite! For these points, being extension-less, and sticking to that in our algorithm, means that our points will never be coincident - the division of the space between them using that given reasoning would just go on forever.

Now, in The Arrow case analysing the movement into discrete positions is the problem. Certain other problems can be addressed in that way with meaningful results, but not either explaining, or even describing, the movement itself, it only makes sense if the infinite divisibility of space is always possible within finite processes, otherwise, as in the Paradox, all movement would be impossible!

Now, both of these two conceptions are *Abstractions!*

And these are designed to facilitate the achievement of useable results in particular circumstances. But, it is how we use them that either works or doesn't: neither fully delivers the actual situation! They are both simplified-abstractions that only work with the correct methods - correct, that is only when used in a particular way.

You cannot separate the abstract concept from both its producing context, and its companion-methods!

Let us come at the problem from a different angle to attempt to throw more light upon what we do in Mathematics.

Collecting data from a situation in which only two variables are allowed to change, we get a set of pairs of values, which can be plotted upon a Two Dimensional Graph. We can use this graph to read off corresponding pairs of values, but it isn't very flexible, easily useable or even accurate. So, mathematicians attempt to construct an Equation relating the pair of variables, which can be fitted-up to the captured data-set to fit-to-them as closely as possible.

What the mathematical processes effectively do is similar to drawing a smooth continuous line through the two-variable situations plotted individually as dots upon a graph. Neither the drawn line nor the calculated version of the Equation is exactly the same as the original data, but they are close!

The advantage of the Equation is obvious: substituting a value of one variable into the Equation can give the value of the other corresponding variable (if you are a mathematician, it is easy)! But, though very close and eminently useable, such extracted results are never exactly right!

Now, If you knew both variables already in a particular situation, you wouldn't need either the Graph or the equation. So, you only use these methods for the situations that were NOT available from experiment - in other words for positions between the dots on the graph, but now supplied by a drawn continuous line and the Equation, AND crucially calculate-able, rather than having to judge from either version of the Graph.

Now, not all situations are as easy as this sounds, as sometimes substituting the known variable into the equation doesn't give a direct value for the other, but just

another equation in a single variable (the one you seek). Now, if you know how to solve such equations, then that can be carried out, but sometimes that isn't possible, so we have to return to the idea of the graph and construct a geometrical method of approaching ever closer to the required solution by a series of geometrical tricks, which by repeated application get closer and closer to the required solution.

You could draw these upon the graph, but a more accurate way is to derive from the geometrical method PLUS the original Equation, via what is termed an Iterative formula - thus using the advantages of calculation guided by a geometrical method of approach.

But note, this method, though very useful, has two major draw backs:-

1. - it is another example of an infinite process, and therefore has to be terminated artificially when the accuracy reaches acceptable proportions,

and

2. - It is only as accurate as the equation can be.

Now, the reader may wonder why this seeming-long diversion was necessary! But, it demonstrates rather clearly how clever tricks between both Continuous and Discrete methods attempt to home in upon Reality!

They are necessary because of the errors implicit in a pluralist approach, but they are pragmatically useable as described above: They are ideal for technicians and technologists who just want the thing to work, but totally damaging for real scientists and philosophers attempting to understand and explain Reality. The current mess in Modern Physics proves this conclusively!

Centuries of successful use of the above described methods have demonstrated their validity in producing intended outcomes, resulting in the modern world that is dominated by Technology.

But that alone by no means includes the most profound contributions achievable from such investigative methods that precede the predictions and productions addressed above.

By far the most important extractions from such investigations are concerned with understanding-why things behave as they do - in actually explaining natural phenomena!

Now, this is a very different process from how results are dealt with by technologists, for instead of only dealing with Form-and-Pattern (via Technology), this alternative approach is concerned with exploring natural Cause-and-Effect (Science). Technology uses Prediction to enable Production-for-Use, while Science seeks Causes in order to understand not only a particular phenomenon, but to extend such understanding generally over ever wider areas.

Its oldest embodiment and tool was in Analogy, wherein a complex sequence of natural processes was seen to recur, or be closely similar, to those in other very different situations, which encouraged investigators to seek similar causes in each. Such were not yet Understanding, but did indicate that such would perhaps be possible.

Now, as explained in greater and necessary detail elsewhere by this writer, Mankind was not evolved via Natural Selection to "understand" anything at all!

The driving imperatives that were selected-for, were to do with survival and reproductive success, as made possible by mutations to do with the living processes of Man as a living organism. *Understanding* couldn't be delivered by such means! Indeed, Hominids, and latterly Man, have been around for millions of Years, but it was only just a few thousand years ago that Mankind experienced the Neolithic Revolution, which led to the first new lifestyle beyond the very long-standing Hunter/Gatherer phase (which involved only a pragmatic relationship with reality concerned with survival), and a new static phase involving concentrations of people, communicating and co-operating, and, in-so-doing transcending the prior limitations upon what determined Man's successes and range of suitable habitats.

But, even so, the brain which had evolved over billions of years in the development of animals could not, and still has not, become able to directly access the reasons why things happen the way that they do. And, to the present day Man still has no direct means of accessing Absolute Truth! We have developed elaborate and often flawed methods of trying.



All explanations that are arrived at will always reflect the still inadequate mental facilities built into our genetic inheritances. All such are partial, and a still largely inadequate understanding can only be passed on socially: they have to be taught by those who have achieved something, and learned by the new generations.

Now, the achieved level of understanding can never exceed the level of experience, "prior understanding" and socially-extended language achieved by Mankind, in innumerable attempts, in many different areas, to tackle Reality by primarily trying to understand it: just effectively using aspects of it will never be sufficient! And, whatever gains are made by such means, they are never components of Absolute Truth! They are, at best, only more accurate reflections of a complex Reality: and, as with all reflections, they will not only be incomplete, but will also always, in certain contexts, greatly mislead us: the conclusions and any consequent courses of action will be wrong!

And, the most significant socially arrived at premise that causes most of these failures is the Principle of Plurality! As Zeno discovered, and Hegel diagnosed, this seemingly "obvious" principle only ever approaches certainty in persisting interludes of Stability - when things are maintained to remain the same! So much so, that it is easy to see such circumstances as the natural norm. But, such an assumption, though often pragmatically very useful, is not what we assume it to be. And, many of the most lauded intellectual disciplines that Mankind has produced over literally the whole of its existence - such as Mathematics, Formal Logic and even Science, have all been erected upon this false supposition - though reliably useful when applied within a maintained Stability.

Surprisingly, it took 2,500 years to go from Zeno's discovery to Hegel's diagnosis, and a coherent, consistent and comprehensive application of an effective solution is still awaited.

When Karl Marx transferred Hegel's purely idealist achievements from thought to concrete Reality in general, the solution looked very likely. But, the dominating influences in the then current, and even the now still persisting capitalisr society, found Marx's revolutionary conclusions a total anathema. And, to this day, the remaining Peaks of Science still require to be conquered.

Hunt's contribution to a

Holistic Methodology in Science

Tim Hunt's discovery of cyclin was clearly not the only situation in which Hunt's revolutionary methodology could be used. If he had pursued his objective using strictly pluralistic methods, he might still have discovered cyclin, but it is highly unlikely.

The difference in the two approaches is crucial, for whereas the pluralist route involves extensive and rigorously controlled local conditions to reveal a targeted objective, by suppressing all others, it also removes things away from Reality-As-Is into a tailor-made locality or Domain, wherein as many "affecting" factors as possible have been removed, leaving only a chosen couple to investigate. Such impositions upon the living and reproducing cell, which had to be Hunt's area of study, would disable its multifarious and simultaneous processes, which alone bring the cell to its crisis point when cyclin is produced.

So, removing that real and complex system, would also remove the possibility of the required outcome being achieved and investigated. You would, inevitably, be investigating something else!

Now, the holistic alternative takes account of all this, for only it attempts to study the real situation exactly as it occurs. But, it also, of course, often makes any real analytical gains impossible, for heretofore most holistic experiments were totally opaque as to what was actually going on. For, in order not to affect the real complex of processes, most holistic experiments so protect the actuality, that nothing of the internal activities is even visible, and all that is achieved is a final result when the analyses of what has been produced, can be finally carried out.

How it occurred is still totally hidden, and the only method open to researchers was speculation. So, Pluralistic Science, though ideal in many situations, is

almost entirely useless when dealing with Living Things. It has always been clear that Life is most definitely entirely holistic, and pluralistic methods will simply kill what we are at pains to reveal as living processes. It is like studying Life by dissecting dead organisms. Something can be gained, but the real living process is unobtainable.

Miller's famous experiment was a remarkable achievement in that he knew what he had to do to get any sort of real results, but in delivering the correct conditions, he also cut himself off from what was actually going on within his apparatus.

But, in an important sense, Hunt had learned the lessons of Miller's unavoidable failure. He not only used a strictly holistic, non-interventionist method, but used the natural living processes of his subject to quite normally and naturally compensate for any sample that he took, and, in addition, made sure that he revealed the timings and tempos of processes as they happened, by taking samples at regular intervals for analysis. He also used Gel Chromatography to produce analysis, which could be laid out in the exact order in which they had occurred in the living organism.

On inspection of his results, Hunt was able to see exactly what was going on (or at least what was present) at the very times when cells divided – the protein cyclin was temporarily produced, which evidently played a role in this crucial process.

Taken together Hunt's techniques could be applied to a New and revealing Miller's experiment. This would maintain its holistic approach, but would attempt to surround it with analytic sub experiments designed to sample without changing situations at many points throughout the physical extent of the experiment, and also throughout its temporal existence: times and places for what was being produced could be extracted without



changing its overall trajectory and results. It would then be feasible to begin to get a handle on what was going on throughout that event. Clearly, what had happened within Miller's set up was NOT a single process. It must have involved whole sequences of processes, many happening simultaneously, and various sequential stages would also have occurred. It would only be towards the end of this holistic orchestration that the final amino acids could possibly have been produced.

Now, we have to be clear that to achieve what we have to in such a situation could not be more different to the usual pluralist methodology. In the usual methodology, the idea is to more and more successfully isolate a particular relation acting at a particular time and context. Each experiment, chasing the separate components in a system will therefore be very different for each objective. Each will be optimised to deliver a particular relation, where all other factors have been removed or suppressed.

In the end the scientists have in their hands a whole set of such relations, every one totally predicated upon its own-carefully-designed Domain. At first sight the integration of these into a coordinated system seems impossible, but a handy principle "saves the day".

It is assumed that each extracted relation is independent of its context (so we say it is separable). So what was found in a particular defined and constructed and maintained Domain, will occur exactly as such in Reality-as-is! Thus, the confused situation that we see in unfettered Reality is assumed to be that way merely because of *Complication*: the many relations deliver a "summed effect". This crucial assumption meant that scientists could continue with their pluralist methods with the final objective of revealing all, after which any particular phenomenon could be both explained and produced.

NO, it couldn't!

What is behind such an assumption is the belief that the relations so extracted are primary and the observed results are secondary: it is essentially determinist.

But it says nothing about development and the creation of the New. It is about re-mix only. It cannot ever explain the appearance of new entities as it is retrospective.

Such creations are always inexplicable and unpredictable. And that is perfectly true, if your methods are pluralistic.

To really explain Reality, not only in stable localities, but, in general and crucially in its development, then Plurality is useless. For that you need to address Reality holistically!

Laws do not produce Reality. Reality produces Laws - surely that's obvious when you think about?

Now clearly, Hunt's results did point the way to a new methodology in Science. It addressed the holistic nature of living Reality and attempted to reveal both its tempo and multi-stranded trajectory. But, it was a special case, and for more general use it would need a great deal of amplification, and certainly a new approach.

Somehow reality had to be taken as-is, but it had to be opened up: its inner workings had to be revealed, and Hunt's techniques along with the use of separated pluralist analytic techniques could ultimately deliver the goods.

And of course, the proof of the pudding is in the eating, so the evident place to start has to be the re-design of Miller's Experiment. And Hunt's way of interpreting what he revealed showed that a cyclic process of hypotheses, redesigns, and further modifications of the experiment, could indeed gradually reveal the likely inner workings that happened at each successive stage.

Hunt noticed the exact correlations between the appearance and disappearance of cyclin and the division of a particular cell. He could then, with separate analysis of cyclin and the variations in other substances around these changes, suggest the possible processes involved. Questions could be asked about what was the state of cells immediately prior to the appearance of cyclin, and what happened thereafter. Clearly the cyclin was not only produced when required, but also removed when it would cause problems. The area of study was in relatively constant qualitative development and change, and in both subtle, yet powerful control by means of particular enzymes.

But we must pause here and consider what exactly the cyclin caused to happen!

Instead of the single cell, absorbing nutrients and growing in size, some sort of major crisis was brewing, in which a simple continuation of those processes was impossible. The cyclin was at least a part of that change which totally

halted the usual processes and instead switched activity to an almost opposite process: instead of maintenance-as-is, the processes were set in train to radically prepare the whole cell for a total split. Everything had to be re-organised and replicated to ultimately deliver TWO full sets where one had existed before, PLUS the divisive processes to enact that split! All energy would be diverted into these essential preparations and the converting processes. While all the usual processes were wholly suspended, the cell undergoes a *revolutionary* reorganisation, which finally results in the cell dividing into two. I will not detail what is going on in all parts and particularly in the controlling nucleus, but I'm sure informed readers will know what kind of revolution this transformation involves. And yet it seems to have been triggered by the production of cyclin!

Now, I am not knowledgeable enough to take this technical discussion of Biology any further. That is surely a job for the specialists in this field. My task is to consider the *implications* of Hunt's developments, and how they could be applied in ever-wider areas to revolutionise scientific methodology generally.

Suffice it to say that the overturn would finally come to completion. Two cells would exist where one existed before, and the cyclin would disappear from the situation. Hunt had delivered the first holistic methodology for following the trajectory of development of a fertilised egg, it revealed *cycling processes* with significant revolutionary results at each stage. Wholly viable cells were produced, which themselves could do what their parent cell could do (at least in the short term). So truly, holistic biologists being presented with Hunt's work could indeed carry-it-on!

Now, Hunt's method was predicated upon an ideal situation for his method to work easily. That would certainly not always be the case. For in re-vamping Miller's Experiment with Hunt's methodology in mind, the problem of sampling without interference would be much more difficult than for Hunt. And the problem of sampling would have to be applied in an extensive series of very different areas within a new design of the apparatus, which would have to do TWO (not necessarily compatible) things.

The first would be to not interfere with the natural processes of the situation being studied, and the second would require careful design to facilitate sample taking at

crucial sites where significant processes might well occur at some particular times during the whole experiment. Indeed it would never be like an experiment in a test tube.

The sites for particular processes would certainly be distributed throughout the system, and would only occur when everything necessary was available at that site. So, for the right things to be monitored at the right times, the first essential requirement would have to be a planned pathway, which the processes would have to be directed through. Now such a physical route is clearly not easy to devise before we know what is going to be happening. Clearly, the initial design will be hypothetical, and results will NOT deliver the answers we are finally seeking, but will indeed allow significant revelations of omissions, and lead to the redesign of the system to improve the extent and relationships of the sampling sites. And this will inevitably lead to careful re-arrangements to ensure that ALL the significant processes are taking place where we can sample them. The directing of flows will be crucial, as will the rates of these flows, but after a whole series of these modifications the researchers will be presented with time-sequenced data from a series of sites throughout the apparatus.

It is clear that the very first pass will seem to deliver totally unintelligible results. What else could they be if the rates of sampling and the sites are totally inappropriate?

NOTE: a whole world of significant qualitative changes can be missed, by many of the techniques beloved of pluralist scientists. (For example averages could deliver zeros where significant oscillations are occurring.). But finally, after a mammoth amount of study and modifications, streams of data could be available which could be made some sort of sense of.

Also the sampling and testing would surely involve complete sub experiments in themselves - specially designed to be totally isolated from, and hence have zero affect on the main experiment, but nevertheless being capable in such conditions to reveal what was being produced and when it was occurring.

And, of course, the timing side of all this would be crucial. Not only would analyses at specially designed sites involve regular samples being taken at precise moments, but also the rates of sampling might have to be different as process followed process, and the tempos of change might well alter radically.

Thus the New Holistic Experimental Methodology would certainly NOT be the usual isolation, control, maintenance, extraction and finally abstraction of the pluralist experimental method, but it would necessarily involve a long gestation period, in which all these factors would have to be perfected to deliver what was actually going on, as multiple, simultaneous strands.

Such experiments (and their rich multi-stranded results) would be as different to pluralist methods as Cheese is from Chalk.

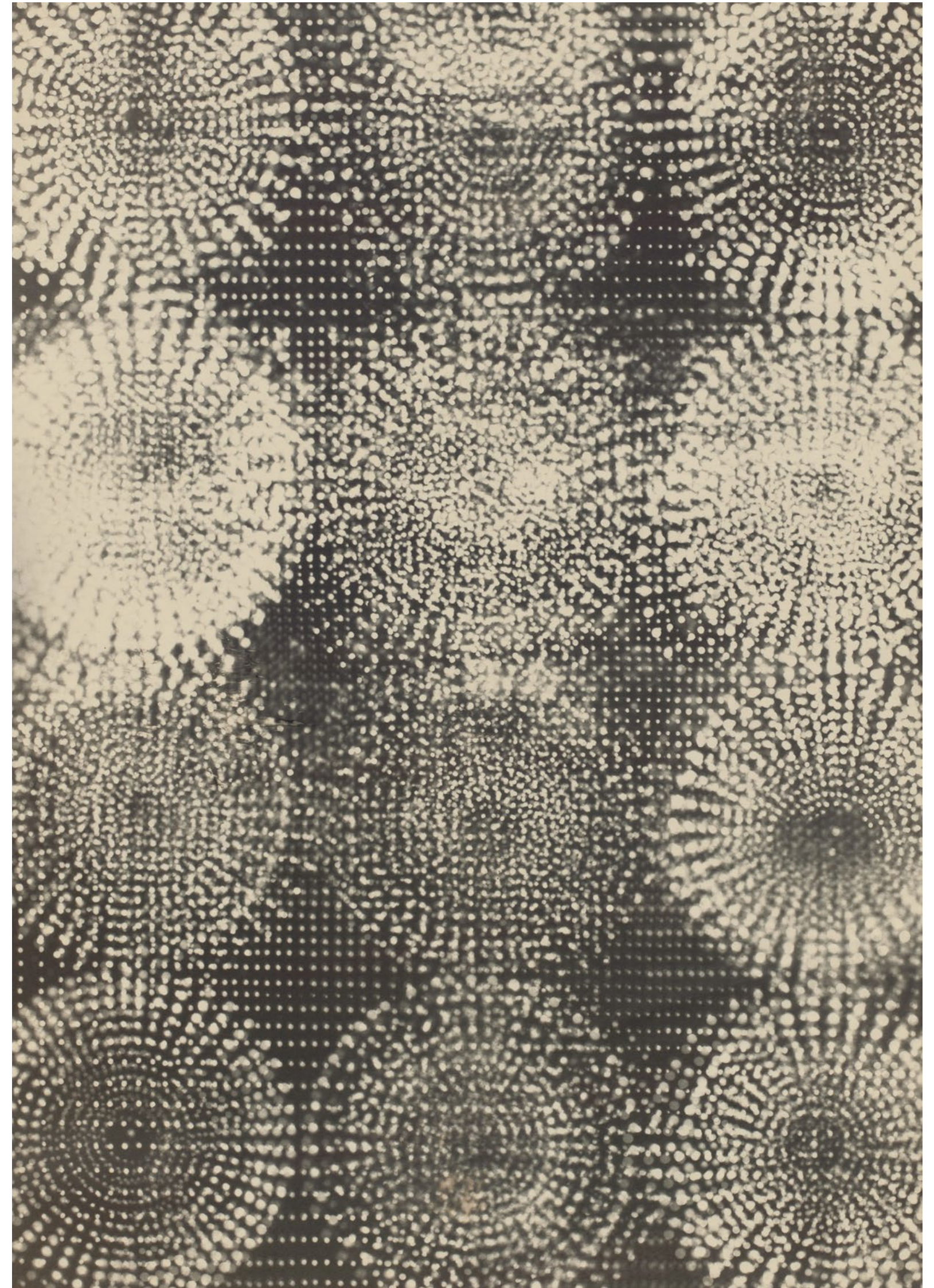
And the dynamics involved would be crucial.

NO LONGER the stir-thoroughly-and-wait-for-equilibrium, of the pluralist method. What was to be attempted now was to monitor Reality-as-is and on-the-fly as things actually developed.

My favourite analogue for this change is the work by chemists and mathematicians into Chemical Reaction Fronts in Undisturbed Liquids. Prior to their work, the “stir thoroughly” imperative guaranteed that the actual dynamics of reaction would be totally lost in a majorly and energetically mixed situation.

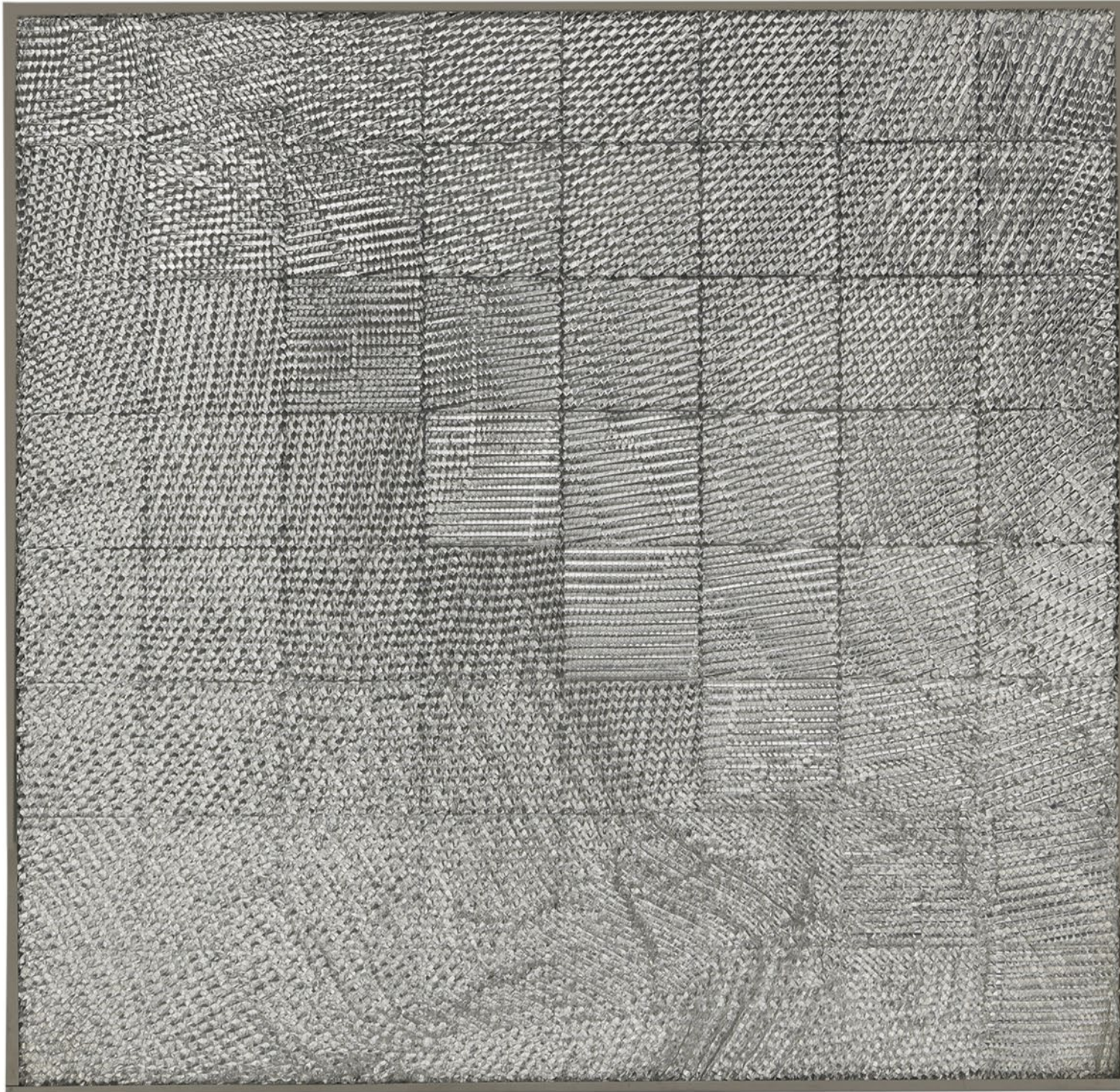
By insisting on the exact opposite – absolutely NO disturbance whatsoever – and using oscillating reactions with differently coloured resources and products, they were able to reveal that these reaction fronts naturally followed Toroidal Scroll formations.

So you see what could be revealed! The dead meat of Pluralist Science would be replaced by the living organism of Holist Science.



Holistic Iterations: The New Science?

A glimpse of a possible scientific methodology for studying qualitative change



The grave weakness of strictly bottom-up Causality (and its usual defining ground – Plurality), is that its determinations (conceptually, at least) tend to flow only upwards – from lower cause to higher effect!

Yet, in spite of this clear restriction, we can, nevertheless, erect some finite, multi-stage sequences of cause-and-effect that do indeed reflect something-of-Reality, and which we term Reductionism, with a genuine approval of its usefulness. And, we can even consider multi-strand, simultaneous complexes of such causal chains, though entirely without either top-down or even lateral causal effects between them, for, we are often hard pressed to model such situations effectively.

So, with Plurality as a basic-and-unquestioned Principle, we cannot really consider much more than expecting merely repeating, unchanging cycles, when Iteration is introduced into our schemes.

In fact, the original and soon widespread employment of such techniques was generally only considered to be as purely-mathematical-frigs, to merely get closer to the solution of difficult equations, and therefore possesses absolutely nothing concerning the possibility of a more accurate means of explaining something of Reality as it really is!

Indeed, with those algorithmic methods, as are the norm in computer programs, our attempts to model many difficult and unavoidably-holistic situations (by the usual means of pluralistic Simulation) abound with such iterative cycles, which, when used alone, are always infinite, and therefore have to be artificially (rather than intrinsically) terminated, when indicated as necessary, by some sort of regularly applied accuracy-tests.

[The Achilles and the Tortoise example in Zeno's Paradoxes always looms large in such methods involving infinite processes with finite results]

And, apart from their use as described above, they can also figure in our thinking of more complex natural situations in Reality too.

The basic conception of such techniques involves many such cycles, and as something similar also happens in the World at large, to get closer to what actually happens there, another invented (though this time a conceptual) frig has also had to be smuggled in.

This involves tiny (often merely random) changes in such cycles, which deliver a kind of “incremental drift”, and this is deemed to finally topple the system over into a new form. By such means, therefore, we “bring-in” Qualitative Change as a consequence of purely quantitative increments.

It can be made to “fit”, but it is always a continuing process, terminated by an immediate and inevitable switch, which has been experienced previously, and then linked to a key parameter passing a given threshold value. So, it is, of course, merely a simplified model of what actually happens - a pragmatically organised event without any explanation.

But, it does NOT involve those absolutely necessary *Crises*, which can go one-way-or-the-other, and can even culminate in extended, and accelerating revolutionary transformations. For such, by their very nature, break all of the above described reductionist sequences, and instead precipitate a cataclysmic dissociation, and a following, and indeed a totally opposite, “creative” phase, which can never be predicted from pre-event circumstances.

But, the usually applied form is an assumed model, and is qualitatively different, in that it merely accumulates to a quite natural transition point, validated by previously seen evidence, but neither understood nor explained.

And, even if our conceptions go a little further towards the actually occurring Transforming Event, they can only see the evident dissolutionary crisis maturing, never getting to the following tumultuous interregnum, and consequent change to a higher unpredictable Level, which always completes such an Episode, when it is successful.

So, it is because of this myopia, that we promote the Second Law of Thermodynamics to such an exalted and primary position, in our view of the World, and substitute “Mere Chance” as the reason for any contrary-yet-true following progressive developments. And, without any real understanding of such Emergence Events, real Qualitative Changes can never really be explained.

Now, this theorist has, after a long study, conceived of an all-embracing *Theory of Emergences* (SHAPE Journal Special No. 1 in 2010), which sees two opposite processes involved in all Qualitative Change, which always occur within these short, revolutionary Episodes. But, it is, admittedly, a very general conception, and is certainly still packed full of many of our pluralist past-methods. So, it is by no means the last word on such ideas. It is, on the contrary, only the very first word, in a wholly new approach, for it takes all such episodes, in all circumstances, and occurring at all Levels, as Events of a similar nature.

And, to find a Common Form to cover everything from the Emergence of Matter, to that of the Origin of Life on Earth, and on even to Social Revolutions, is clearly too wide to be anything but an attempt to define a new and sounder look at, and philosophical basis for, Qualitative Change in general.

The initial point made in this paper, concerning our many attempts to model Reality, and our various pluralist methods, has to be comprehensively addressed, not merely from the correcting of our overall view of how things are statically, but also in the detailed processes of actual Creative Change too. To shoehorn all changes into quantitative methodologies such as The Calculus, is not only too restrictive, it is essentially incorrect too (as was proved (inadvertently) in the book “A Certain Ambiguity” by two Indian-American mathematicians Gaurav Singh & Hartosh Singh Bal (though their aim was the very opposite)!

By our current methods, we always impose a “contrived

stability” (based, it must be admitted, upon actually occurring Stabilities in Reality), but always deliberately omitting the crucial factors and processes, which are the only possible sources for real Qualitative Change, and also how these necessary interludes of Change are precipitated.

Yet, though all these criticisms are true, they are not the only type of conceptions occurring in the thinking of Mankind. Now, though certain major areas seem to be totally beyond redemption (such as Modern Sub-Atomic Physics for example), there are other areas, which are unable to avoid dealing with Qualitative Change throughout! These are, of course, the disciplines concerned with Life, both in the physiological aspect and the medical aspect, for Qualitative Changes are everywhere and absolutely crucial. And, even what might be considered mere mechanistic areas, where Physics, and its shortcomings, would be expected to “Rule OK!”, the longer time periods of Geology and Cosmology are also areas, where it is the explanations of Qualitative Change that are paramount.

Now, the newcomer to Science might well be perplexed at what seems to be a reprehensible set of damaging assumptions, which have seemingly misdirected our forefathers in the pursuit of the Truths-of-Reality. But, these were not only understandable, but were also totally unavoidable, because Reality is dominated, most of the time, by long periods of Stability, where our chosen assumptions are not far from what is actually occurring. We therefore quite naturally, and indeed properly, concentrate upon the commonest and easiest areas to study.

So, as the proliferation of disciplines that have to address real Qualitative Change has occurred, we do have areas to study to perhaps extract a very different methodology to what we have come to call the Scientific Experimental Method. For, that has been the source of many major mistakes.

Even within Stability, the true Holistic Nature of Reality made it almost impossible to actually extract previously glimpsed, and quite evident contributory relations, and Man could not even commence with what we term Science, until he could “hold still” a defined locality sufficiently to clearly reveal, and then enable the extraction, of, those formally-only-glimpsed relations.

Science, as we know it, was therefore founded upon the creation of Controlled Domains, and the aforementioned methodology is entirely limited to those alone. In experiments to reveal relations, the scientist must first isolate an area, and, within it, control all the major current factors involved. With nothing but experience and skill, the good experimenter can construct an appropriate Domain, and only then will the required methodology, which can allow the measurement of a selection of now clearly-visible, related factors, while holding constant or suppressing others, to deliver the sought-for relation, via an artificially constructed Stability!

Now, I absolutely insist on calling this (the usual experimental methodology) - *The Pluralist Method of Experimental Science*, because it assumes the Principle of Plurality to justify its approach, as a sound method for extracting “really existing” and “entirely separable” relations from the confusing mix that is the norm in Reality-as-is. Hence, if we are to criticize this approach and replace it, we must be sure of our ground, while, also, replacing idealistic Plurality with real Holism.

We need a Holistic Experimental Method that is not solely based on these Domains and analytic Plurality.

Now, as is always unavoidable, when preparing for a revolutionary change, we have to address all the above features both of Reality, and of our usual assumptions and methods. And though we can lay out (and Mankind has many times in the past) an alternative Philosophical Standpoint, we must give a great deal of attention to our basic conceptions and consequent assumptions-and-methods, at the level of our interactions with, and consequent conceptions of Reality.

Thus we must address what was suggested at the outset of this paper. Let us first repeat what is necessary.

1. We must recast our Thinking to see Reality as Holistic.
2. We must remove the incorrect assumption that what we find (in pluralist investigations within constrained Domains) are truly separable elements in Reality-as-is.
3. We must, when dealing with Qualitative Change, realise that it cannot be adequately addressed by our usual pluralist methods.

4. We must admit to, and then study, the actual interludes in which such Qualitative Changes occur – the so-called Emergences.

5. We must re-invent experimental methodology to cope with holistic phenomena.

6. We must study Emergence as it occurs at all Levels of reality to begin to realise its main common trajectory.

7. We must recast our thinking as Hegel insisted was essential to construct a Logic of Qualitative Change (what he termed a required Science of Logic).

This isn't totally new territory for science. There have been holist scientists before! Darwin was one, as was Wegener, and Hunt in his discovery of cyclin in the cell divisions within fertilized eggs did indeed develop a new, time-based methodology, which could transform the way that experiments are conducted and interpreted. Indeed, Miller's wonderful holist experiment on the origins of amino acids in the primitive conditions of the Early Earth, though it was abandoned by his colleagues, because it could not deliver what was actually taking place inside his “Black Box” approach, could be transformed by Hunt's methods.

Only yesterday (15/05/11) in a TV programme on the work of an American professor who had discovered Angiogenesis – the eliciting of new blood vessel production by some kind of emanation from cancer cells into the host's surrounding tissues. He had to suspend implementation of clearly vital medical processes for most of the rest of his life, because pluralist chapter and verse was demanded by his colleagues.

Now, the reader might wonder about the title of this paper – *Holistic Iterations*. Why did I commence upon such a topic? And, have I revealed what I considered was involved? The answer is surely, “No, not yet!” And, this is because I am in no position to deliver such a thing, currently.

It is an objective, and not an already-cracked methodology. But, perhaps the foregoing has made somewhat clearer what needs to be addressed.

Our usual modeling, in simulations, can never deliver what really happens, for we do NOT reveal causality, we just insert switches based upon experience. We

terminate our “still-pluralistic” iterations with threshold switches to new ground. Whereas the proposed Holistic iterations will do things, which never appear in our current mechanisms. They will precipitate dissociative avalanches, and consequently deliver the necessary ground for creative change. Are there any who relish such a task?

By pure chance, I was recruited by a superb mathematician Jagan Gomatam, to deliver for him computed illustrations of chaotic behavior via iterative forms of modeling of the actions of the human heart. His objectives were, of course, mathematical! [Now, the legitimacy, of such an orientation, had been proved by his purely formal (mathematical) investigations into Reaction Fronts of chemical reactions in liquids. He demonstrated (and formulated mathematically) that these Fronts took the progressive form of Toroidal Scrolls]

But, in my purely “tradesman’s hands”, though I delivered what he required, I could not but be amazed and excited by some of the results that I found. Indeed, these iterative methods delivered real phenomena that the normal determinist equations never could. All sorts of aberrant behaviors were produced mathematically including Fibrillations and even terminal Heart Attacks. Now, such just had to be explained!

Clearly, chaotic iterative forms were directly derived from the original deterministic equations, BUT, and this is really important, those equations were not devised from measured data. They came from a functional theory turned into an equation! So, that source plus the methodology associated with iterative forms had revealed MORE than was available by purely formal equations. This has to be crucial!

Now, clearly such methods are still man-made techniques, but nevertheless the process – even though NOT exactly what happens in Reality, must have reflected aspects of that Reality, which were impossible to get by our usual means. So, iterative methods coupled with equations derived from Theory (and NOT mere measurements and formal patterns) had to be investigated to reveal why this was so.

NOTE: We couldn’t only put it down to the Theoretical source, because the deterministic equation from that when used in the usual way DID NOT reveal these behaviors. It had to be coupled with the process of iteration to achieve that.

Clearly, there are distinct stages in our commitment to revealing Reality.

The first, assuming a strict Plurality, has delivered our equations-for-use in prepared circumstances, which though NOT what actually happens in Reality-as-is, did still empower Mankind to USE what he was able to extract.

Next, we have Theory, which considers the actual causative factors in Reality and attempts, with the help of the equations based upon pluralist measurements, to formulate exactly what is going on, and why. Though, it must also be admitted that, sometimes, direct measurements are not available, and the equations may be directly-derived-from the theoretical considerations alone.

Then, finally, we have the usual iterative methods, which could get closer, as described above, and reveal further phenomena.

What had to be the-next-stage was a whole new, scientific methodology founded upon the above gains, but, at its heart, could only be a holistic alternative to Plurality.

Mankind had to address the true holistic nature of Reality, and devise a better philosophical standpoint, and a better experimental and theoretical methodology, to take things forward.

NOTE: Elsewhere, the first steps have been undertaken by this author with the redesign of Miller’s Experiment [now published in SHAPE Journal].

The Pluralist and Holist Alternatives in Experimental Science

Now, the recent on-paper run-through of an attempt at a holistic Simulation still has, unavoidably, many of the trappings and flaws of Plurality. This is because it uses all the usual techniques of Simulation developed solely within a pluralist approach. It both isolates(conceptually) because it takes this small set of processes in total isolation.

And it “incrementalises” (in its changes) because it turns a real continuously changing set of mutually affecting processes into a conceived of series of cyclic steps.

Such are, of course, unavoidable as the initial step in an analysis of these things, but it does not reflect Reality in all but the smallest fraction of the interacting content of the Real World – even though considering only those, which would certainly have a direct effect upon this crucial group of processes.

NOTE: Later in this short paper I will be referring to the re-design of Miller’s Emulation of the processes taking place within the atmosphere of the primaeval Earth, but because of the discoveries made recently concerning iterative processes as distinct from those employed only in straight determinist equations, a start had also to be made into Simulation, for physical Emulation cannot be the sole method of investigating this developing new approach in Science.

Simulation also had to be tackled.

A truly holist view would certainly have to take this single strand as part of a whole group of many different strands. The diagram produced to accompany this first attempt at a holist Simulation, would have to be accompanied by a whole stack of others – taking place simultaneously, and also interacting to modify one another.

The resources and products involved could also turn out to be these lateral connections, as the catalytic agents could also play roles in other strands as well as in the given included strand of the Simulation.

And, perhaps the most significant of all, this single view takes place in NO background, or in a completely unaffected background. And, of course, that is a crucial assumption – for the transformation of context is what, in the end, will unavoidably remove that nexus of conditions, which allowed this particular sequence/cycle to originally come together. And such an inevitable change of Context will (in Reality) ultimately bring about the demise of this (as with every other) strand, unless that too (i.e. the Context) is part of a maintained system at an even higher level.

Now, such a realist and holist view does not mean that we should immediately abandon all our endeavours with the comment ringing in our ears, “Give up now you’ll never do it!”

Indeed, one truly great scientist, was determined to get around the difficulties by addressing them directly. He didn’t know what processes would be involved, but he had a fair idea of what the actual environment must contain, and he set up a sealed, physical emulation of the circumstances to observe what might have occurred. The scientist was, of course, Stanley Miller, and his context was the atmospheric and liquid environment of the early, pre-life Earth. He knew, of course, that any static mix would get nowhere, and deliver nothing of the actual processes that would finally deliver Life on Earth, so his experiment had to be both dynamic and cyclic, and driven by the only input he could be sure of in these circumstances – heat! So, he constituted the most basic components that the early atmosphere was likely to have been consisting of, and added a form of “weather” based upon the water cycle of evaporation and precipitation,



and a driven set of bodily movements based on this situation. In addition to the known gases, there was included liquid water, and regular inputs of heat. The latter would set up atmospheric movements, but in addition would turn some of the water into vapour.

In addition such energy would also enable any endothermic reactions, so literally all possibilities with the given content would be expected to occur. He also provided a Still arrangement to condense the water vapour and produce "rain" and intermittent electrical discharges to emulate the Lightning that storms would have added to the mix.

The total isolation instituted was NOT the usual, pluralist simplification of Reality, with its purpose of making the extraction of relations much easier, but on the contrary, a means of keeping-put all modern life and other possible contaminants from entering his experiment. After a week the liquid water had turned a ruddy-brown, and on subsequent analysis was found to contain amino acids – some of the most important building blocks of all subsequent Life on Earth.

Now, this approach attempted to replicate, to some extent, the real conditions of the early atmosphere, and unlike pluralist experiments, which are performed with rigorously selected subset of content, and an iron grip on all conditions and components, Miller let his un-simplified set of components do what they would naturally do. Instead of the usual objective of restricting things to a single relation and process, this set up several expected simultaneous processes, to both occur and affect one another. And, such a set-up would inevitably traverse a whole series of phases: They would also do these things whenever and wherever they were possible, and hence would continually affect one another in an ever-changing context.

And, most crucially of all, they would quite naturally form first sequences, and then even cycles of processes, and these would passively compete for the available resources and inevitably change the relative amounts of the components present, and in addition, would also be generating new components and therefore cause more complex interactions to become possible: the context would inevitably change significantly.

This could not only result multiple in strands of these complexes of processes acting simultaneously, but also

changing as they continued, for they would be releasing an ever wider range of products into the mix, which would not only feed existing processes, but would also provide the bases for wholly new ones too.

The fully holistic set-up also meant that it could not possibly be totally constant. It would both vary and develop, due to its complement of possibilities of developments, and consequent even further and different interactions.

The trajectories enclosed within Miller's apparatus were multiple, sequential and even cyclic, self-modifying and, of course, entirely unknown. The experiment, as it stood, could not reveal its obviously happening events and developments. It did though demonstrate that they certainly existed, without allowing them to be actually known. Amino acids did indeed develop, from such a basic mix of primordial components on Earth, but as to how this took place in detail was not revealed.

Now, as you might expect, Miller's peers were not impressed.

The general public, though, considered his experiment remarkable. But that general public don't "do Science", and those that did were dismissive of an experiment that both proved that such processes could occur, but was at the same time, totally unable to reveal the details of what had actually taken place.

It is very interesting that they preferred their usual pluralistic methodology, for though it did not reflect Reality-as-is, it did demonstrate single, isolated possibilities. Though such would not lead to anything other than those that might well have occurred in Reality, their role in development was certainly totally unavailable from their restrictive way of carrying out their kind of investigations.

You may therefore wonder why they were totally agreed on their methods as against Miller's, and the answer should be evident. They could predict an outcome in their carefully set up and maintained conditions, and their single tightly controlled processes. They could also use what they had demonstrated for their own conceived of purposes.

The pluralist methodology may not reveal any of the actual developmental processes of Reality, but it did

empower them to make things, in carefully devised and constructed circumstances. It worked in Production!

Now, though, at the time of Miller's Experiment, there were not the techniques available that could take his emulation much further, and, in addition, certainly could not deliver any "explanation" without detailed time-based data, it could only lead to un-provable speculation: nevertheless, all of these drawbacks are not still the case today, and things could be changed radically to overcome these limitations.

Indeed, this author has suggested a re-designed version of Miller's effort, which would attempt to get time-based data in structured pathways through a version of Miller's sealed set-up, without allowing, thereby, any contamination of the enclosed environment by these seemingly invasive means.

Two main aspects would be crucial. Let us consider the inner Form of the apparatus.

Without in any way changing the basic principle of the experiment, physical (yet inert) pathways through various local conditions could be provided, so that time-based data could be monitored along natural transport routes within the set up.

[Positions near a source of heat, near an arranged location for "lightning strikes", or close to the Still, and indeed a whole series of others could be considered, which would be obvious candidates for data-taking, and the consequent air and water currents would tend to carry substances about along such pathways, if the structures facilitated them, and thus enable hypotheses as to various included processes occurring at different stages.]

Such supplied inert conditions would not direct or compel particular processes, but merely allow theorists to make more conceptual sense of the time-based data received throughout the experiment from position along likely transportation routes.

They would be merely formal structures but would allow interpretation of the data collected in terms of their timings and positions along such routes.

The main principle would be to deliver possible pathways for both atmospheric and liquid movements between localities.

Clearly, even in Miller's original version, there would be sequences and indeed cycles involving water. At some locality sufficient applied heat could cause the addition of water vapour into the atmospheric mix mere by evaporation, and warming of the local atmosphere would cause it to rise delivering the classical differences in pressure in various areas, and the cyclic flows between them. Some physical channelling could cause some of the atmospheric movement to encounter the Still section, which would then condense it back into liquid - like "rain" and have delivering "flows" of liquid which could transport substances to other areas. The positioning of the electrical discharges would also be within one or another of these structured flows, where conditions would most closely approach those in thunderstorms on Earth.

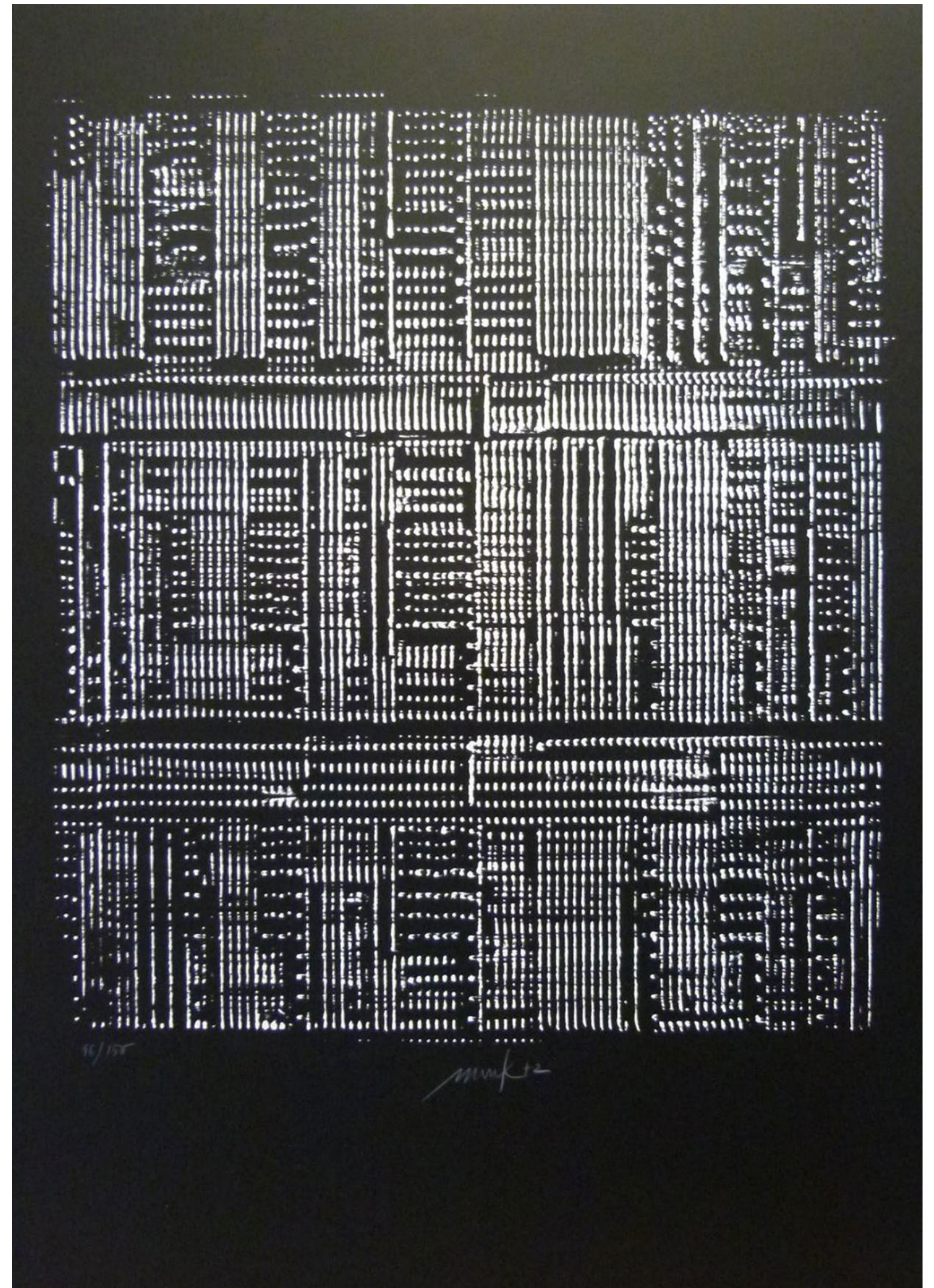
Now, these structural arrangements could also determine the best positions for where samples could be taken.

And, turning to the actual taking of these time-based samples, it is clear that to be limited only to evidence at the end of the experiment was totally inadequate to allow for anything other than speculations as to exactly what had occurred and in what sequences.

On the other hand, evidence from throughout the Experiment would be essential and could make for much more soundly based hypotheses. The taking of samples at regular intervals, would allow phases and sequences to be put in the correct orders, so that products from one processes could be seen to be available for another. And with these streams of data from very different and crucial positions, along with the likely "routes between", reasonable ideas of how the system as a whole and over time gradually was able to produce the amazing final products could be revealed.

The most crucial feature of these samplings would be that the actual conditions within the Experiment would in no way be compromised. The sampling would have to be by an arrangement that would take a small sample, by a method that would allow absolutely NO passage of anything in the opposite direction.

Now, having obtained timed sequences of results from known positions over the duration of the experiment, it would be necessary to lay them out revealing the contents, as they appeared and continued, moment-by-moment.



Electromagnetism

A holist approach

Hunt did this with his time-based samples from the fertilised egg of a sea urchin, and was able by using Gel Chromatography, to demonstrate the appearance and disappearance of Cyclin at crucial junctures in the episodic processes of cell division and hence make the correct theoretical conclusions as to the role of this important substance. Clearly, a similar sort of processing of the time-based data from the New Miller's Experiment will require very similar treatments to reveal what we need to know.

As the reader will have already guessed, these brief comments on a redesigned Miller's Experiment are only included here to illuminate the differences between a classical pluralist and the new holist approaches to the questions involved in investigating unfettered Reality. Elsewhere on SHAPE Journal, this author has published a long and detailed account of exactly that Experiment could be transformed. It would not be designed to produce equations, but to deliver the information in timed sequences from particular locations within the system, to allow an informed attempt at revealing the processes involved, and hence allow the beginnings of investigations into such transforming episodes in development. Clearly, as distinct from the end-products only nature of the original form, the new design would instead deliver time-based streams from throughout the duration of the experiment, and from particular situations within it. The hard structures also provided would allow this information to be seen in the context of possible flows of materials from one part of the apparatus to another.

And it should be emphasized that the sole purpose of an initial run would be theoretical and speculative, but it would lead to hypotheses and a redesign of the Experiment to confirm or confound those ideas. A whole series of such versions would then ensue, and also involve quite separate pluralist sub experiments to investigate individual isolated versions of the suspected processes would also be available. Ultimately, a multi-strand and mutually affecting conception of what was going on would finally result, and Miller's great idea would finally deliver what was only inferred in its initial configuration.

And, not inconsequentially, we would also have the first of a new type of Holistic experiment, where the distortions of pluralist isolationism were abandoned, and the Real World embraced.

However you look at it, some features of Electrostatics and Magnetism are still puzzling from an explanatory, scientific standpoint, even after James Clerk Maxwell's remarkable and unifying set of equations. For they seem to only effectively describe many phenomena, but they do not revealingly explain them.

Now, we should, as scientists, expect this, for all equations, no matter what data they concentrate into a succinct formal encapsulation, have this very same limitation. They are wonderfully concise formal descriptions, and in appropriate circumstances they can be effectively used to both predict and produce desired outcomes. But, they involve only universal-and-general formal patterns, and when taken alone they can *explain* nothing!

Indeed, this very important limitation is also compounded by the absolutely necessary construction of the appropriate conditions for such patterns to be seen to apply. We can only extract such formalisms, if we have appropriately constrained our studied Domain, so that the individual relation appears very clearly, and can be extracted as such a purely formal pattern. In other words, all such equations require, in addition, a full production of that exact context.

Indeed, it is clear to many philosophers that such formulae never even describe Reality-as-is, but deliver only idealised patterns, that actually exist as such only in the man-made World of Pure Form alone, which we call Ideality.

To interpret them as Laws of Nature, that determine concrete Reality, is always incorrect. They are formal patterns "almost" occurring in Reality, but only if it is quite dramatically filtered and modified into an artificially "farmed" state.

So, in spite of many assertions to the contrary, Science isn't "done" once an equation has been extracted and abstracted from a carefully constituted and maintained Domain within Reality. It has only just begun, as it still has to be explained!

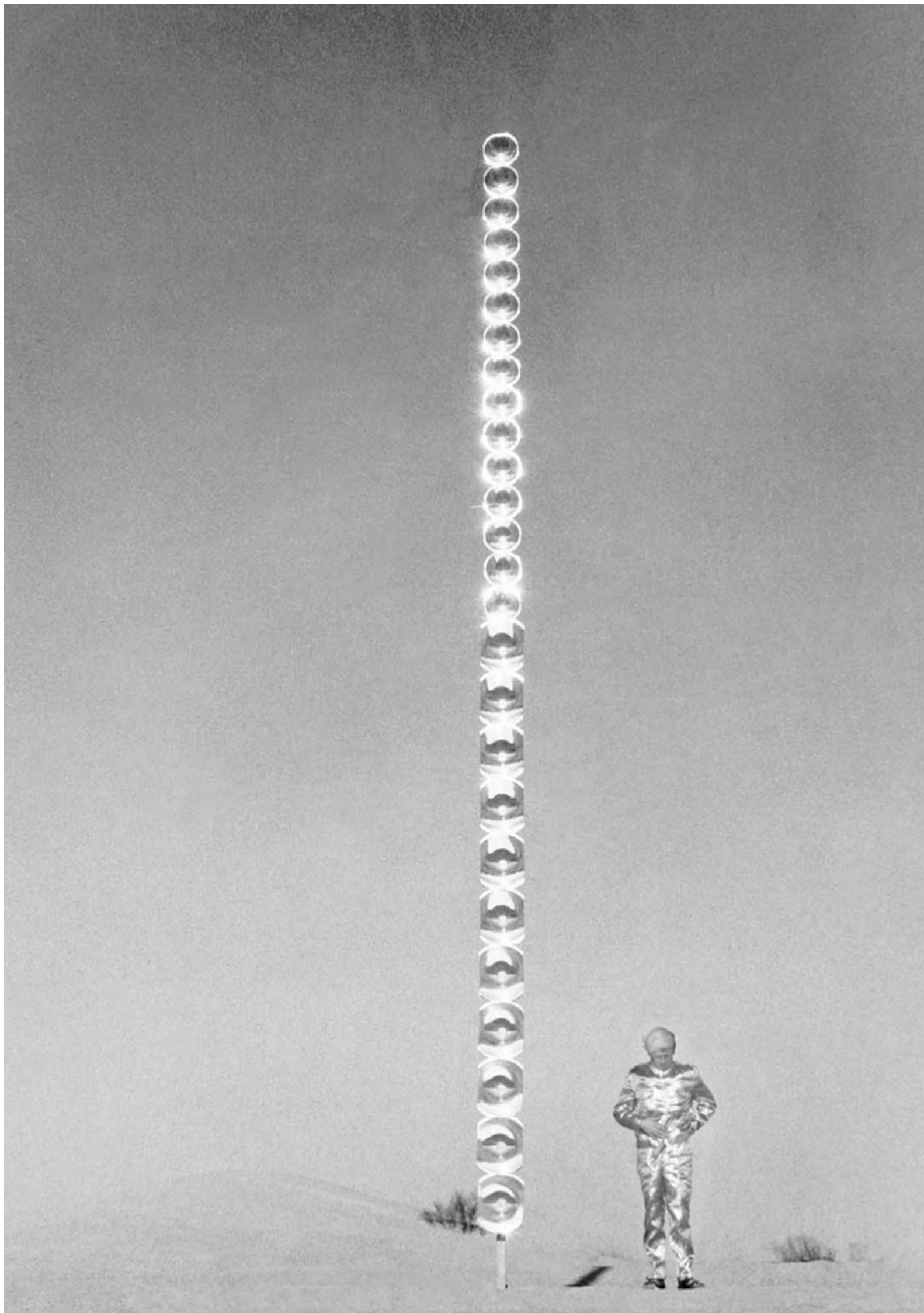
Now, the above is not meant to be a condemnation of Equations: they are clearly extremely useful, but to begin to put together some sort of understanding of Reality, we must always "follow-through", and explain what we extract, via properties and causes: we must explain exactly why things behave the way that they do. And, each possible explanation moves forward our sought-for comprehensive understanding.

And, of course, this is much easier said than done, because our World is entirely holistic. Everything affects everything else to a greater or lesser extent, and we can never, whatever methods we use, extract perfect truths. All our explanations will be partial and provisional, and to progress we cannot stop at descriptions, patterns or even equations: they are not enough!

Our attempts to explain are the only guarantees that we can move forwards in our understanding. And the wider are our successes, the more equipped we will be to make better sense of phenomena.

To consider the scientific process as complete as soon as an equation has been extracted, terminates this essential investigation prematurely, and warps our understanding into thinking the disembodied, formal relations actually drive our clearly, concrete World.

For the formal equations and even proofs are NOT revelations of our concretely-existing Reality, but of the formal-only reflection of it in Ideality, which is unavoidably significantly less-than Reality, but also limitless formally!



What can be established, by equations, are properties and rules of Ideality, which are, at best, distorted reflections of the concrete World! A blackboard full of equations is NEVER a definition of some aspect of Reality.

It is an idealist position, and leads to a total dead end – as proved by the current state of Sub Atomic Physics, with its current investigations which are not into concrete Reality, but instead into the purely formal World of Ideality, where Parallel Universes, non-explosive Big Bangs, Physical Singularities, Strings of disembodied pure energy and other purely formal inventions are all that they can deliver.

Think about it! What is a Natural Law as delivered by an equation? It implies that Reality runs according to formal rules. It just isn't explanatory!

If all this is true, what can we say about Electricity, Electrostatics and Magnetism, apart from Maxwell's purely formal equations? They are obviously different sides of the same intrinsic, concrete factors in the real World, yet Maxwell had only concentrated their consequent, formal relations into his set of Equations.

The question arises, "Just how much of this particular group of real features are encapsulated (purely formally, of course) in his equations, and how much actual concrete, real-world, Causality do we have in our hands, when only in possession of these essential Laws?"

To every equation, we must also ask the question, "Why is that so?"

That question is entirely relevant because, as with everything else that we do with these features, we do not study, analyse and use them as-is. We always, spend time, effort, and indeed expense (consider the Large Hadron Collider, for example) in constraining their physical context, and ensuring that our formulae will dominate in made-to-measure Domains.

NOTE: Classically, of course, most scientists always did a great deal more than this. They thought about what they had revealed and constructed some sort of explanatory narrative, which became the "explanation" of the phenomenon, but it is surprising just how loosely these two representations were related to one another.

Indeed, it is very revealing to look back at the many interesting and surprising demonstrations and experiments in this field, which were performed by scientists in the 19th century (particularly as entertainments at the Royal Institution in England) These hit the uninformed audience like magical tricks, and though in classic, formalist fashion, certain aspects could be arranged to be extracted one-at-a-time, and by the sleight-of-hand of the Principle of Plurality, "explained" as context-independent, and indeed as Eternal Laws happening in concert, what was taken away by the audience lacked any coherent and meaningful explanations.

But, really the accepted conformation of the approach and results was always predicated upon successful subsequent use. And this could, once again, only occur in appropriately constructed and constrained Domains to deliver some very particular ultimate purpose. So, instead of comprehensive and consistent explanation for a particular discovery, the usual confirmation was always merely successful purposive use as the accepted confirmation.

NOTE: *The Engineers*, who only had the equations had to spend vast amounts of time and effort delivering these essential Domains. Indeed, so-called inventors (like Edison, for example) never discovered new things: their whole methodology was to take the discoveries of the scientists and turn them into useful and sell-able products.

Now, all this being so, it is clear that a great deal more is always necessary, in addition to any extracted relations and their consequently abstracted equations. For example, the propagation of electromagnetic radiation, through what is considered to be entirely Empty Space needs a great deal more than the Maxwell equations.

It may, by the supporters of that approach be considered their banker area, because Empty Space does approach the required features of the ideal Domain (as it certainly plays that role in cosmological gravity studies). But not every phenomenon involving these features occurs on such fertile ground, for other contributing factors are usually unavoidable, and easily prepared tailor-made Domains are often impossible to arrange. And, as in history, the scientist, in such circumstances, has to also solve what the causal factors are, and exactly how they make certain things occur.

To plot a way through a real-world complex situation, you need more than an abstract equation.

So, let us begin with the areas that this theorist has already begun to address – the already mentioned propagation of radiation through Empty Space is obviously one, and the setting up of electrostatic fields in similar areas is another.

The real stumbling block for physicists, for almost a century, has been the famed Double Slit Experiments, which the proponents of the Copenhagen Interpretation of Quantum Theory could only deal with using Wave/Particle Duality and Probabilistic Equations. This became the touchstone and had to be dealt with properly. Now, the Double Slit Experiments were solved, by this theorist, without any recourse to the formal and “philosophical” frigs of the Copenhagenists, but it involved a thorough-going renovation of the assumptions upon which prior scientific thinking had been founded, and indeed, a wholly new and very different philosophic basis had to be devised in order to produce anything approaching a comprehensive explanation.

What were immediately dumped, as clearly and provably untrue, were the universally accepted Principle of Plurality, and its consequent promotion of formal relations to a fundamental role as eternal Natural Laws, and that supposition was replaced by the entirely opposite stance of Holism. Also, the “ground” of a purely Empty Space also had to go too, as it delivered absolutely zero in the way of explanation, not only in these Experiments, but also in the propagation of radiation and Action-at-a-Distance via ostensibly “Empty Space”! Instead of totally nothing in Space, there just had to be something totally filling it, even if it was undetectable by all the usual means. This replacement was proposed to be a universal Paving of real entities that could indeed propagate electromagnetic radiation, NOT as disembodied pure Energy, but as quanta contained in the individual paving units, where it could be temporarily stored in internal orbits, and passed on from unit-to-unit by induction. For, even via such a means, it could produce, yet also cause to vanish, with the slightest interventions, all the wave-like phenomena associated with those experiments.

Perhaps surprisingly, this was fully achieved with a paving of what had been previously termed positronium particles, when they were originally discovered in High Energy Accelerators, but here in Empty Space were very different in that they were both stable, and could

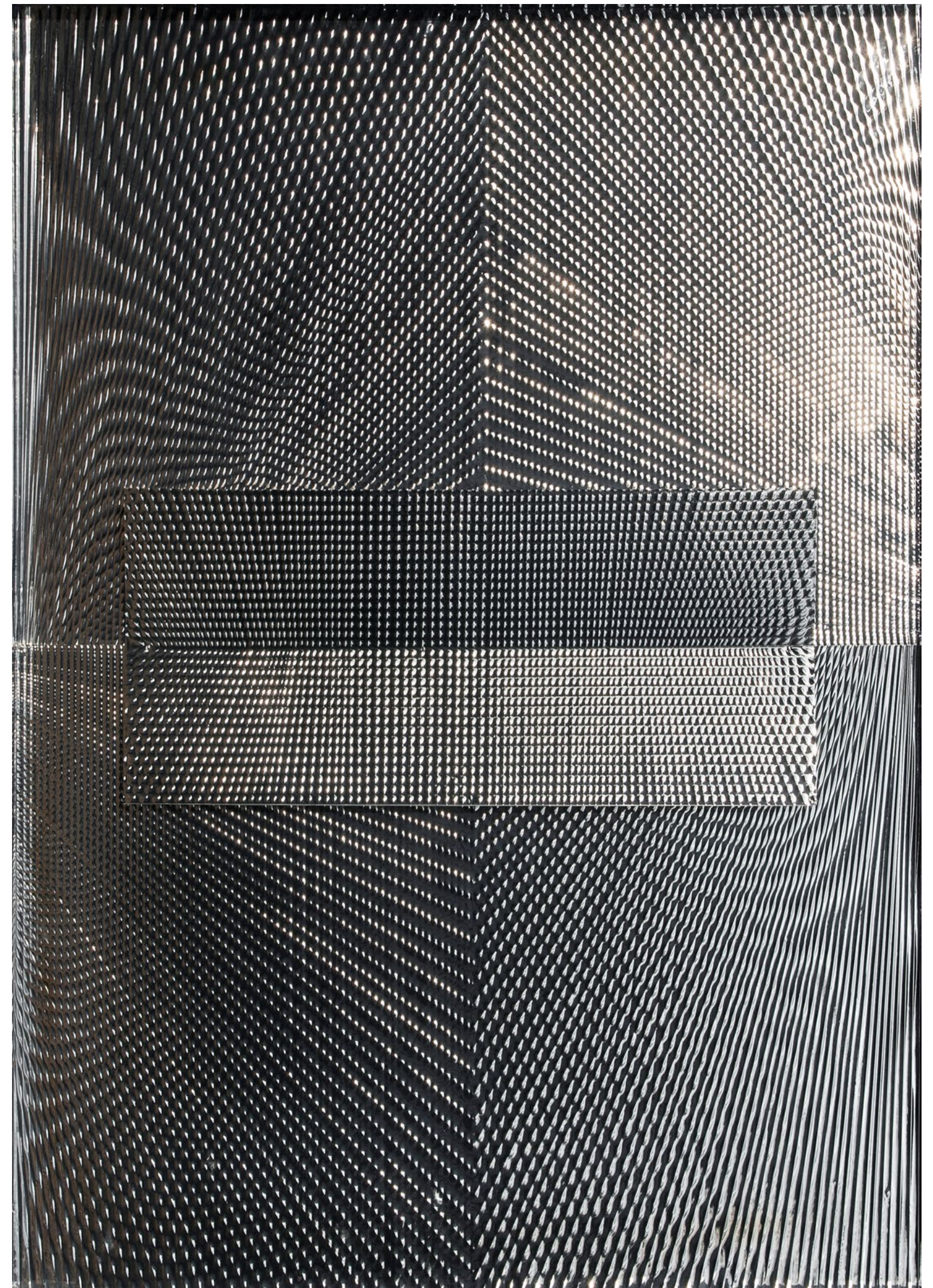
both hold and propagate quanta of E-M radiation. All the phenomena of the Double Slit Experiments were explained via these entities.

Following this, the even more intractable problem of electrostatic and magnetic fields, also in supposedly Empty Space, had also to be solved on the same basis, but the initial suppositions of the constituents of the paving of Empty Space proved to be inadequate to these added tasks. Clearly, there was more to Empty Space than the originally proposed paving: it had to involve other particles too. Nevertheless, the filling of Empty Space was the only viable starting point, and with extra and different particles also involved, even this conundrum has also appeared to be close to a comprehensive solution.

Now clearly, as a scientist, I do not turn my “solutions” into a world-encompassing answer to everything. I am well aware that every “explanatory” theory will be improvable or even replaceable by something better as our studies proceed. But, unlike the sceptics, I do not consign all theories to the dustbin as purely man-made inventions. I know that they can only maintain their status by containing more Objective Content, than the theories that they have replaced. And that such “fragments of truth” can still be successfully used to achieve some intended outcomes in appropriately arranged conditions.

What was really achieved in these “successes” was undoubtedly philosophic: the use of Plurality had been basic to Science for centuries, and though it was based upon real dominances to be able to deliver, it simply wasn't for the right reasons and had to be debunked, and more correctly resurrected only as a very useful pragmatic technique. The real approach just had to be holistic – like Charles Darwin' and Alfred Russell Wallace's work on the Origin of Species, but applied in Physics too.

Now, this turned out to be much easier said than done! Stanley Miller had devised an entirely holistic experiment emulating the atmospheric processes of the early Earth, and by initiating a “natural weather cycle” in an entirely sealed system, he had produced amino acids – the very building blocks of Life, quite automatically, without any external direction. Yet, what had been going on within his sealed experiment was completely unknown: none of the simultaneous or sequential processes could be identified, only a final product of a holistic system of processes.



Yet, in spite of this evident proof that such organic processes could quite definitely have occurred in the early Earth, there appeared to be no obvious way of revealing exactly what had happened and in what order to produce the final crucial substances. The scientific world soon forgot Miller's achievement: they had much easier and more revealing methods, though based upon an entirely different methodology, and, crucially, an opposing and incorrect philosophical set of assumptions. That approach they would never abandon for some "Black Box" method, as used by Miller. The achievements of Holist Science were shelved, for lack of any regularly productive methodology, which Pluralist Science could deliver without much trouble.

But, very slowly, here and there, holistic discoveries began to supply what Miller's Experiment had lacked. Hunt, the Nobel Laureate, had used a time-based sampling method in his studies of sea urchin fertilised egg development, and by this means was able to discover that cyclin was the active ingredient that precipitated all cell divisions. He had used an entirely holistic method, without any equation as his objective, but to reveal the active substances causing crucial processes in the development of living things.

Clearly, with such methods, and the correct purely-pragmatic use of pluralist techniques for analysis only (each performed on samples taken from within, but processed outside of, the sealed holistic experiment). So Miller's experiment could be redesigned to do what Hunt had achieved, and hence make possible the determination of what was happening inside his apparatus.

Now, after this enormous introduction, perhaps we can, on proved ground, begin to apply the new holist approach once again to Electricity, Electrostatics and Magnetism?

Apart from the success in explaining the Double Slit Experiments, this researcher then settled upon Fields as the most important area to be tackled, and again using the idea of a universal Paving or filling of so-called Empty Space, the task began to explain how electrostatic fields could be established within such a substrate in its reaction to the presence of an electrostatic charge.

Once again, the essential ingredient had to be the substrate, which would be undetectable, but which would have to include orbiting electrical charges within

its elements. For immediately we would have magnetic properties too - an orbiting charge would also deliver a magnetic effect perpendicular to the plane of the orbit. So, the components of the substrate could rearrange themselves around a contained charge in a particular pattern. Hence with an appropriate mix of constituents in that space-filling substrate, it would be possible to explain electrostatic fields - though surprisingly they turned out to be magnetic!

The surprising feature meant that in interactions between charged particles, the effects on the substrate, to bring about the observed effects, were clearly magnetic, though if we ignored anything but the involved charged particles, we could only conceive of them as electrostatic. And, convincingly the energies involved in moving the charged particles due to interaction came entirely from the substrate itself.

Addendum:

This paper is approaching five years old, so it represents a now much improved position in current papers (2018), which will be available with this piece.

Nevertheless, older papers such as this are frequently the best introductions as they reflect the actual trajectory of the theorist in the process of solving basic, often philosophic questions.

The full, and up-to-date *Substrate Theory*, will be published soon in this journal.

Junk or Redundant Genetic Material

Is it just useless clutter or a rich storehouse of possibilities?

In addressing the intended (and, indeed, titular) subject of this paper, it has, clearly, become necessary to clarify a couple of philosophical questions first. There is, associated with such questions as this, an intellectual argument which, in my opinion, cannot be avoided:

It concerns the two clearly opposing philosophic stances that include either Plurality or Holism, and which profoundly affect the assumed nature of many complex areas of Reality, and which also significantly change how such things are addressed in many important studies.

Such problems do not get addressed as often as they should, and, as will be demonstrated here, have become absolutely crucial, in areas such as the study of Genetic Materials - the DNA in every cell in all living things on Earth, and their functions - past, present, or even future.

So, what is this philosophical problem?

Both premises can be, and, indeed, are, used effectively in a wide variety of areas of study, but are clearly mutually-exclusive-opposites. Each works well in what are usually termed "appropriate conditions" (but that, almost always means, "They are OK, when they give the right answer". And, that purely pragmatic judgement seems to invalidate the evident fact that, with the usual contexts, they can't both be right!

Now, generally, such a conclusion is dismissed by saying that each is true in different circumstances, but that isn't true either, for they both arise from identical situations and are equally likely to be the first port of call in any circumstances.

In essence, they constitute a classic Dichotomous Pair of basic principles, which have arisen from the very same ground, and even the identical assumed premises. Now, that makes an important difference, as they are definitely

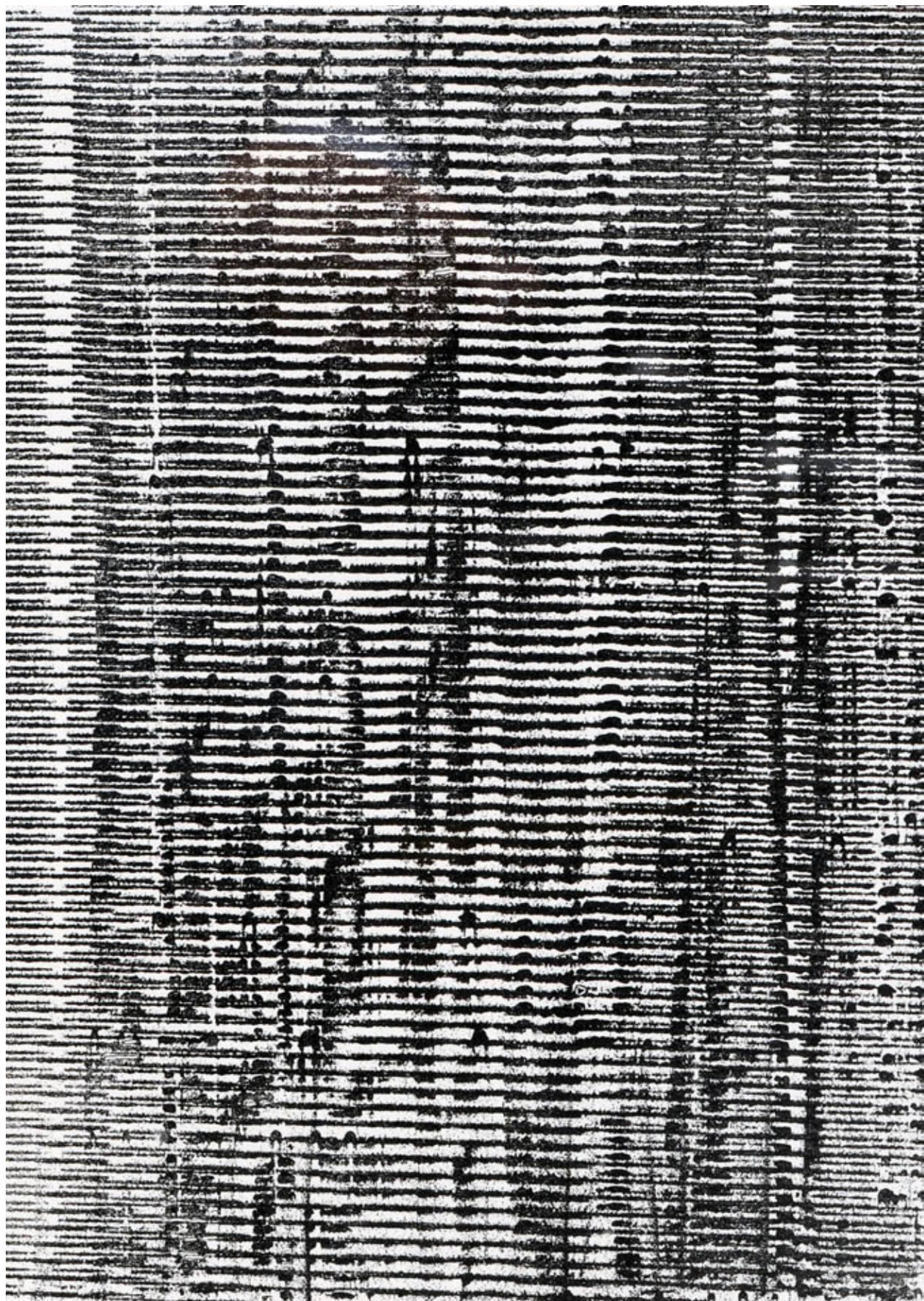
directly contradictory, but, nevertheless, are indeed useful assumptions, sometimes. The primacy of one over the other cannot be established using the apparent situations that revealed them.

But, Man does this all the time, and has done so effectively and successfully for millennia. In such situations, he always keeps both, and switches between them, to find that which works in a given context. If his first choice fails, he merely switches to the alternative, without turning a hair! After all, the first method ever devised by Mankind, namely, "If it works, it is right!", and termed Pragmatism, has been crucial throughout his existence.

But, this Pair make a very odd couple! For, defining one of them seems to directly denounce the other. So, keeping both - the pragmatic solution, has not been possible historically, and the clearly dominant approaches are all steadfastly pluralist. Holism is only ever allowed to creep in, via the most general discussions, to cope with situations that Plurality just cannot address, so it is kept mostly "on the shelf, and on reserve", and doesn't play an integrated part of any credible system of reasoning (but a similar one to the classic "God-of-the-Gaps").

Yet, as with all Dichotomous Pair impasses, which surely follow the same contradictory nature of these two principles, the usual "switching tricks", will, in the end, always fail to allow any further theoretical progress, involving both arms of the dichotomy as valid. And, though seemingly impossible, some sort of holistic theoretical methods will have to be developed, to allow any further progress to even be possible.

NOTE: For, those familiar with Hegel's Thinking about Thought studies, and his original revelation of Dichotomous Pairs, they will certainly respond to the above objection, by saying, "Surely both Plurality and



Holism must be transcended by a thoroughgoing critical study of the premises, which delivered both of them, and the only possibility of any real progress can only follow such an achievement!" Well, of course, that is indeed correct, but such is much easier said than done!

Why, you may well ask!

But, the famous Dichotomous Pairs are not mere inventions – and though never absolute, they do, in both arms, contain sufficient Objective Content (parts or aspects of the Truth) to be significantly useful. So, the necessary process of being able to transcend both, will never be possible until the currently, relatively quiescent side of this Dichotomous Pair, namely Holism, is very much further developed.

At present, it is a rarely used approach – mostly employed by artists of all kinds, who attempt to approach Truth in a very different way from scientists, mathematicians and logicians.

Now, the immediate task – the development of Holism, is exceedingly difficult because it states that, "Everything affects everything else!", and this immediately appears to scupper not only Analysis, but also Reductionism – the assumption of a hierarchy of levels of Reality, with cause-below-cause all the way down to some final, fundamental level.

In fact, literally all of our most useful methods, are still completely pluralist, and involve crucial and unavoidable simplifications and even idealisations of Reality-as-it-actually-is. Plurality requires, and is invariably given, a necessary modified version of Reality, for it to work on in the way that it does. Reality is NOT what the pluralist methods deal with.

It can, however, enable a certain level of explanation, and even understanding. Yet, such pluralist disciplines are replete with assumed eternal Natural Laws, along with their mere Complexity "in sum" – rather than the much more accurate holistic stance of mutual modifications within all natural relationships. And, to complete the regime, Mankind has invented, and to a remarkable degree perfected a series of investigation techniques, which purposely bend Reality into a localised, simplified and idealised form, by actually deliberately farming limited "experimental Domains", which have been deliberately filtered and controlled to make the resultant

area much closer to a pluralist definition. We, cleverly, adjust Reality to make it fit-with our favoured means of dealing with it. Yet, these methods are not mere self-kid: they wouldn't have lasted so long if they were! The pluralist-devised set-ups achieved by the experimental scientists, not only approach what our idealised methods require, but also, and crucially, allow successful use of the extracted "Idealised Laws" to achieve productive ends.

So, you cannot just dispense with this enormous and successful set of idealistic methods. For pragmatically, and as long as they are used in the very-same-conditions under which they were extracted, these versions of relations can be extremely successful.

Indeed, the whole World has been transformed, by these methods of extraction and consequent use, to produce the present dominating Technological landscape! So, to merely condemn Plurality as wrong, would not only miss the point, but also proffer absolutely NO alternative approach. Plurality has been the greatest achievement by Mankind thus far! But, it clearly still isn't sufficient.

There are innumerable features of Reality, where such Farming-of-Reality is impossible, and even more importantly, where such means could never get near what is actually happening: and these are currently simply ignored. The pluralist pantechicon is directed to roar on, full pelt, ONLY where we know we can make it work!

Now, I began this essay because I suddenly realised what the Key Area was, which could only be investigatable by a purely holist approach, and no other! To attempt to understand this area, pluralistically, would fail, (and indeed has, so far failed) to get anywhere in really understanding the topic.

It is not in the Role of Genetic Materials in certain already well-known areas, but throughout the whole of the Origin and consequent Evolution of Life - from the first living things, all the way to today's World, and including, of course, the Thinking of Man. We do have a series of ideas about this, but they are more of a narrative than a real explanation.

What I am referring to is, of course, the vast majority of genes in the "blueprint chromosomes", which NOW appear to be totally useless - they seem to no longer play any kind of role whatsoever: they are considered as redundant, and cast aside into The Attic of Redundant

Means!

Now, as that particular area of a living organism's genetic material amounts to its vast majority, and is usually dismissed as "junk DNA", what actually is that area really about, or more concretely, "What was it for, in the past?"

The usual description is that it was a crucial part of active genetic material, at some far distant time, BUT has been superseded by other better alternatives: or, alternatively, damaged beyond repair – BOTH of which being caused by purely chance happenings, to them or something else, and caused perhaps by such totally external things as cosmic rays.

Indeed, that "theory" means that all irreparable damage, as well as all transforming improvements, caused in that random way, thus produced enough genetic refuse to dominate the remaining active genetic material – at least in its accumulated amount.

But, in addition to these criticisms, we also know that gene-function relationships are only very rarely simply one-to-one causalities. There are also Switching Relationships, where one gene turns another "on" or "off". Indeed, whole systems of genes are needed to control any complex processes.

It is even possible that so-called "junk or redundant genes" can be, just-as-easily modified by the famed cosmic rays to Cause mutations, for example, to enable them to play a new and useful role in current systems to modify their outcomes, and lead to changes at the living organism level subsequently.

NOTE: Elsewhere, in investigating the actual non-living processes which ultimately led to the Origin of Life on Earth, this theorist revealed a fascinating trajectory of developments, turning what seemed to be purely random processes into directed systems of processes, which also delivered a concrete basis for the Dialectics of Development generally.

Clearly, when similar holistic means are applied to genetics, there will be similar revelations.

So, though it is too enormous an area to deal with comprehensively in this paper, let us very briefly also address Evolution.

Just, taking the transfer from a natural, aquatic environment (like the sea) to one entirely independent of that, On Land, many crucially essential processes, dependant upon the old aquatic conditions would, somehow, become redundant due to wholly new "air-based means" to achieve the same objectives – like Breathing for example.

It becomes ever clearer that such absolutely crucial developments will leave whole systems (and the genetic materials involved in their direction) as no longer required. Indeed, the known changes over almost 3 billion years on Earth, will have regularly produced, and thus completely superseded, system after system after system!

Also, the discovery that embryonic developments, in the very early stages, are common to many very different animals, seems to indicate that this is definitely so, and, to an extent, the phases of Evolution are reflected in these changes in present day developing embryos.

Thus, to begin to grasp Evolution, - as also indicated in the fossil records in the rocks beneath our feet, must have implications for the roles of the involved genetic materials- as the idea of them constituting some sort of blueprint, which seems essential, yet also contradicts Evolution, which is also indispensable in addressing this area.

Now, exactly how such things can be integrated isn't at all clear, and will rarely, if ever, be revealed by research programs always directed to profit-making discoveries. For the tail is guaranteed to wag the dog! Real Understanding is never quantifiable in terms of a potential profit, is it? Indeed, it is possible that the genetic materials for long-junked, past-processes are actually still there in the so-called junk DNA, and, miraculously, could be resuscitated by wholly accidental genetic damage – could that not beat least a part of the explanations for Metamorphosis?

Now, of course, if this is so, it has certainly, as yet, NOT been demonstrated. But, let us, nevertheless, consider briefly what is involved in the classic Caterpillar/Butterfly metamorphosis! The two phases are radically different. The Caterpillar Stage is an eating and growing phase, while the Butterfly Stage – a flying insect, enables meetings between unrelated members of the same species that could, initially, be miles apart. And, this is ideal

for genetic mixes in sexual reproduction. Imagine how useless the caterpillar would be if it had to do that stage. And conversely, just how useless the Butterfly would be at getting required bulk and growth from sipping nectar! The fact that certain nymph stages in amphibians can carry on in conducive circumstances long after the point when Metamorphosis has usually had to have occurred, seems to support these ideas.

Clearly, any research into genetically controlled development will be extremely difficult, for to initiate and maintain such processes not only requires the "blueprint", for the process, but also the exactly appropriate environment of the living organism, at precisely the right stage to not only produce the means to "switch on" the required sequence, but also, and just as crucially, to provide the to-be-affected organism, itself, at the appropriate stage for the given processes to be right. NOTE: Crucially, in Metamorphosis, no momentary switch can bring it about. The complete structure of the new phase will have to be produced after dismantling the prior phase. Only then can the new functionalities be delivered.

The big question is, "How could this Revolution be programmed by the genetic materials?" It is more like a Revolution or an Emergence, than a normal functional process.

Frankly, to have an evolved genetic code that implements such a cataclysmic change doesn't make sense. It would have to reflect a major crisis for the organism and some almost miraculous change over to different and wholly distinct code somewhere else in the genetic material, it could be not-currently-used code in the so-called junk DNA, as a long unused historical process, which following some major crisis, is enabled once again.

NOTE: But the seemingly most common event, seems to be for the much older sequence to be triggered at the beginning, and the later mutation only returned to for a brief period, at the end!

Of course, this is merely an idea: to make it viable is a long way off, and may prove incorrect. But, the considerations are sound! We should be considering the possible roles of Junk DNA, especially in such seemingly inexplicable developments as in Metamorphosis.

One thing is sure, two significantly different animals appear on either side of this magical change in the

resultant phenotype. Indeed, you couldn't ever achieve such things as have been addressed above with our current experimental methods and the current philosophical stance, and its assumptions.

With current universally employed and wholly pluralist methods in science, you would have to artificially (in the lab) create special conditions for only parts of the process to occur, and also research the crucial recursive processes, NOT as they actually happen in real living things, but artificially in fragments – short sub phases.

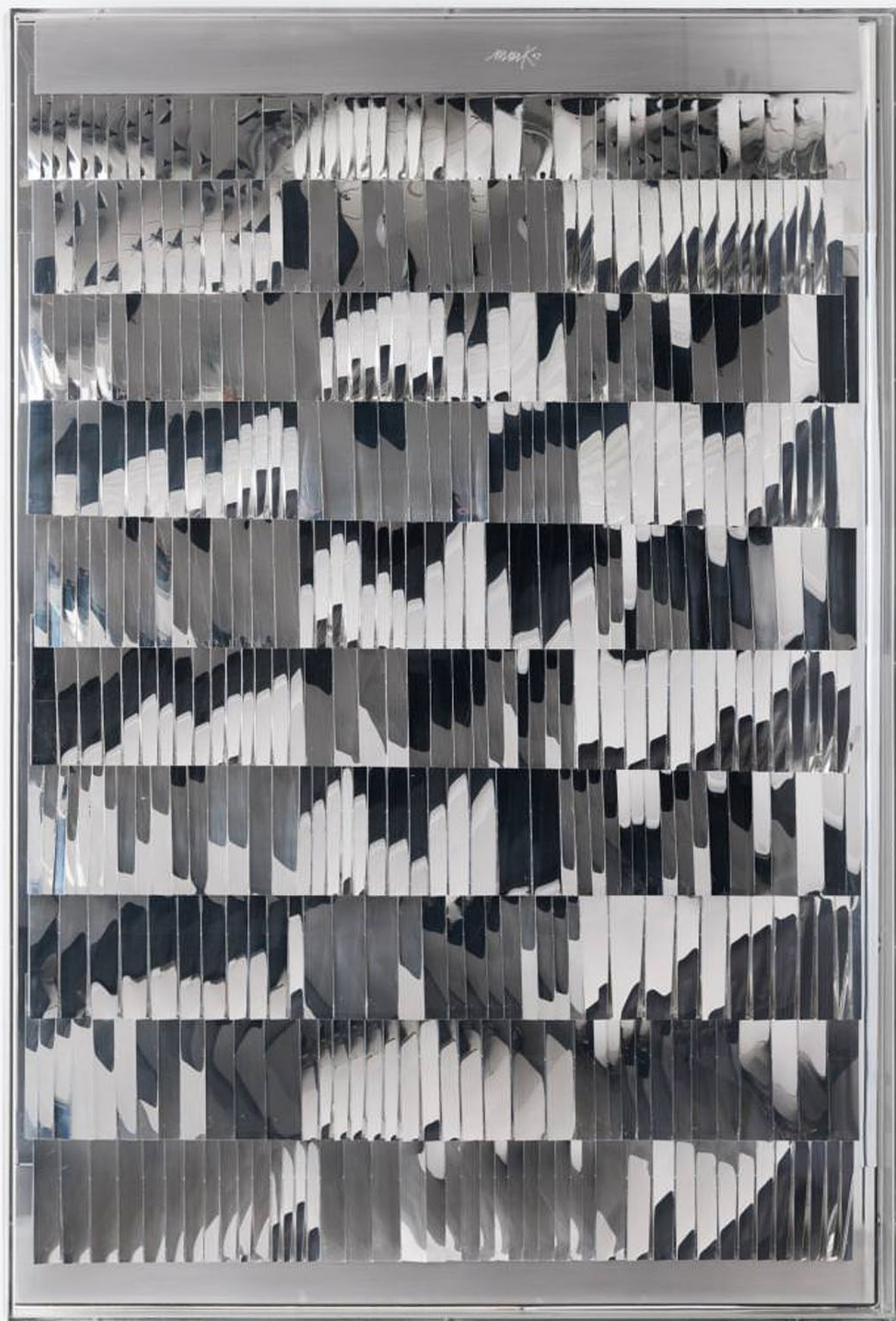
Clearly, it has become clear following the experiments conducted by Yves Couder, that the idea of Recursion is crucial.

For in Life studies, we are not merely producing, as in a pluralist experiment or a factory, but actually creating the producers too! In fact products then become causes, and causes lead to products in long sequences and cycles.

The pluralist method of all of present-day science will clearly be wholly inadequate, while any attempt to "play God" with Life will always be well beyond our capabilities. We, most certainly, as we did with pluralist science, have to invent a whole, new Holistic Science, which will also involve not only the farming techniques of pluralist science, but new techniques to deliver new kinds of information, even though the means used will be artificial and profoundly different from the fully recursive nature of the Reality-as-is-processes that we are trying to reveal and understand.

Yet, talking about as yet undiscovered methods will not, in itself, enable their discovery. But, it is always possible to, momentarily, achieve a single step in a complex process, but it will just come and go without being part of the required overall process. Each will be a transitory-moment, seemingly getting us nowhere. The answer will not be found by the usual methods.

The crucial thing in Reality, and in its evolution, has to be what we call Stability. The tiny step means nothing outside of its own integrated system of many steps. Now, what is it that makes for such a System to become stable? It certainly isn't just the availability of the necessary resources and conditions. They can occur momentarily, but because of a lack of stability, they will, along with other such momentary happenings tend only to produce Random Chaos!



An organised time-based context is necessary.

It is the correct “context” that enables an orchestrated sequence to occur in a reliable way! For, such a sequence we need a changing environment in step with the requirements, within a kind of “system stability” that is by no means STATIC!

It is a *Dynamic* Stability, and it could not be achieved by the single ideal environment, as is essential in ALL pluralist productions (as we use now), but, instead, a sequence of differing yet stable environments (self maintaining during each current step), which also changes into another stable environment for the next step.

Now, if it all seems impossible to ever achieve experimentally. You have to begin to understand the difficulties, and begin to put together a path to overcoming them. Such mutually, in-step sequences of both environments and processes are almost impossible for us to construct as they actually occur. BUT, we might be able to instead make a spatially distributed set of sequences instead of the impossible simultaneous and self stabilising thing we are trying to reproduce. Instead of a single locality with its necessary sequence of stable but different environments, we can separate these spatially!

We construct them by means available to us, and organise the action to move sequentially from one phase to the next across the full range of environments in different places. And, it is we, the experimenters, who arrange the necessary timings. No longer is everything happening in the SAME PLACE, but instead an arranged flow-through the necessary sequence of environments, as and when, they are required.

When working perfectly, we would NO LONGER have to be constantly changing a single space, but still have a reasonable analogy for the required sequences of processes along with each one’s required environment. Clearly, resources would have to be fed in and carried through the sequence of localities, but this would be possible experimentally. Many re-runs would be necessary to enable us to use this analogistic model to effectively reveal what actually goes on in Reality-as-is.

Such a method will not be a direct and perfect model, but the very nature of the method will enable control of flow-through rate to emulate the time-based sequences in

a single place that we are working towards. I believe that such a set up is a holistic one, intended to replicate in some useful way what would be impossible by pluralistic methods, which currently dominate science, and don’t reflect how natural processes and evolution work.

Now, it may interest the reader to know that this researcher has arrived at this very point once before. In attempting to improve upon Stanley Miller’s brilliant experiment, in which he produced amino acids, entirely from an emulated primitive Earth atmosphere, to simulate some of the natural early processes leading to the Origin of Life, it became clear that simultaneous processes might be approximated to by a spatial sequence of appropriate conditions, accessed by a flow-through of materials at the correct rate. The biggest problem with Miller’s sealed single volume, had to be totally isolated from everything else, so nothing could be monitored, and even if you could get non intrusive sensors into it, you would have no idea what process you were getting data from.

Now, it was reasoned that the careful design and construction of a route-through various differently endowed parts of such an emulation, hemmed in by inert barriers, and studded with non-intervening monitors with time-based measurements throughout an extended run, significant and interpretable data could be extracted. A whole series of such runs, with in-between re-designs, to improve the performances, were planned for, but the design was never implemented, but it was clear that it would have been an admirable beginning to define new way of doing experiments, which though not themselves holistic, could in some way be investigated in an alternative, holistic view and could be interpreted according to such a view.

But, even that new Miller’s Experiment would still fall far short of what would be necessary to deliver everything we seek in our current considerations. But, it would be do-able, and would take us much further than any current pluralist experiment ever could.

NOTE: A further explanation has been deemed necessary, as it isn’t entirely obvious how crucial recursions could be included in that suggested design. For, the problem in synchronised alterations to contexts, as well as by the conversion of resources into products, could, indeed, be handled.

Now, the key factor, in the changes of context, comes from the products generated in immediately prior phases. In other words, a prior product then becomes a cause affecting the very things that produced it, especially when intervening effects change it in some way – the classical Recursion. So, the advantage of the spatially spread-out contexts is that we, the experimenters, work that out by prior investigatory experiments, and then institute each new context from these earlier investigations, into the right positions in what will be maintained as a series of spatially separated and maintained contexts. We will have separated out recursion, but then put it back to simulate what we are trying to achieve from real World simultaneous and sequential processes.

Such “Intelligent Design” will always have to be a feature of Holistic Science, because we are replacing an impossible time-based and self-generated, self-maintaining and recursive process with a spatially distributed emulation.

So, returning, finally, to our original problem, the so-called junk or redundant genetic material, with its built-in narrative of its prior history, which becomes a kind of record of the evolutionary history of the species, as well as a history of the given individual’s own development, from its conception, by having the necessary blueprints of earlier embryonic developments too. It must, if it could be investigated, be a veritable storehouse of great value. In addition, it is NOT stored away in some inaccessible archive: it is immediately accessible in every individual cell, if required.

So, “accidental mutations”, which inevitably change the function of the mutated gene, in appropriate circumstances, (including usefully available junk genes) could actually deliver new functions, which if they proved to be an advantage to the organism, could affect its success in survival and reproduction.

In a peculiar sense, the junk DNA can be a mine of features, which could be incorporated into new functions. Indeed, as major changes in a number of genes are incredibly rare, this storehouse of past-and-successfully-used genes could easily be incorporated in safe, protectionist or even restorative methods for safeguarding the genes generally – including possible repairs or replacements to mutation-damaged genes. Junk DNA could turn out to be vitally important in many different ways.

Addendum:

There is an important missing environment involved in using genetic materials to direct necessary processes: it is the environment of the genetic materials themselves. Surely, whether a gene is active must be controlled! Presumably, a gene will be inactive until it is “turned-on” by some means - perhaps the presence of a particular molecule (a hormone?) produced at the right time, and effectively “turning on” all required genes, so enabling a whole process, while another molecule being produced could terminate the process?

The First Steps

in establishing a holist methodology

Stanley Miller’s Experiment

The first attempt to carry out a completely Holist Experiment was that conceived, constructed and performed by Stanley Miller. His purpose was very clear! He wanted to see what must have happened in the early period of the Earth’s history, which led to the Origin of Life.

He was certain that any prior model would NOT help, so he merely constructed a sealed set up containing what was known to have been around on Earth at that time. It included the gases of the primaeval atmosphere, water and a supply of heat. He also included an irregular sequence of sparks to give the effect of Lightning.

He ran his totally closed experiment for a week, and at the end, when he dismantled his sealed apparatus, he discovered that amino acids had been formed.

It was, therefore, a great success – for an important molecule in Living Things had been naturally produced by totally non-living processes.

But, instead of the great acclaim that he and his tutor had expected, the approach was dismissed as undevelopable. No one could say exactly what had happened inside Miller’s Apparatus, and no one, not even Miller, himself, had been able to develop an “improvable method”. So, in spite of what it definitely proved, it was dismissed as a “dead end” method, and taken no further.

Now, this researcher has arrived at a very critical stance, in his own subject, Physics, of the current consensus in that science. And, has arrived at an alternative stance based upon Holism – the exact opposite of the consensus Pluralist stance in present day science. And by returning to the Dialectics of Hegel, and its wholesale transfer to Materialism by Karl Marx, he has begun to

tackle the proliferation of contradictions and even major impasses precipitated by the Copenhagen Interpretation of Quantum Theory that was suggested by Bohr and Heisenberg, which had finally defeated Einstein at the 1927 Solvay Conference, and set Sub Atomic Physics onto its current crisis-ridden path.

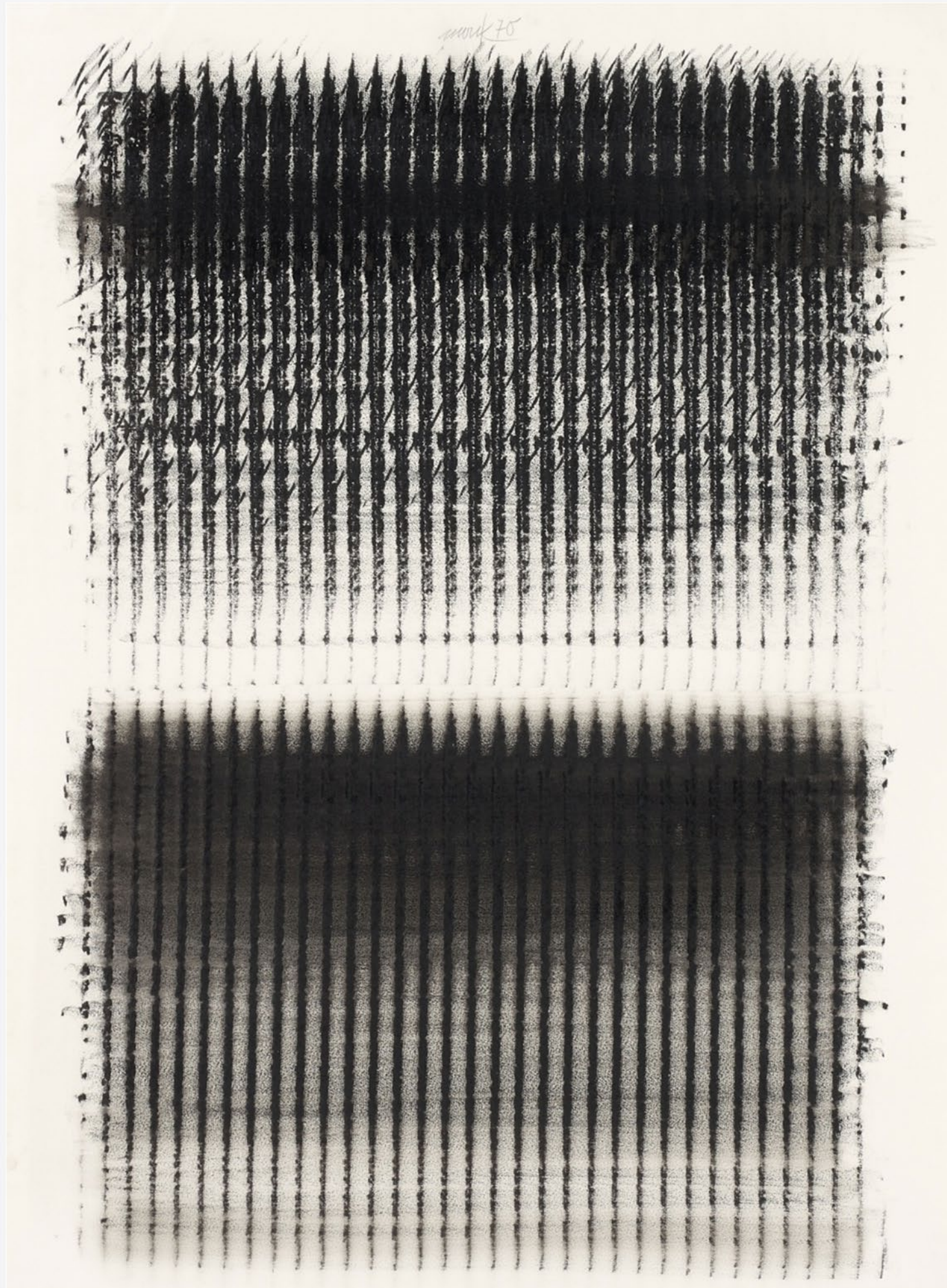
Now, opposition to Copenhagen is not new, but the decision to take a holist standpoint most certainly is. To justify his decision, Jim Schofield (the writer of this paper) decided to tackle the cornerstone of the Copenhagen Stance – The Double Slit Experiments, and using Hegel’s method of unearthing the premises that led to evident contradictions, he was able, by replacing those premises, to explain away every single one of the anomalies found in these experiments.

The main difference was entirely philosophical, yet in the case of the Double Slit Experiments that turned out to be sufficient.

This was followed by further successes (still in development), but also required the definition of a wholly new holist approach to both Experiments and their explanations, so, the Key Task surely had to be the solution of the “so called dead end” in Miller’s Experiment.

Now, this was a very different task to those addressed so far, because we only have Miller’s initial effort to go on, and, of course, the trajectory, from purely non living chemistry to Life itself is a very long road. A version of Miller’s experiment that would be progressively self-defining, had to be the approach.

So, clearly, the objective had to be to investigate the possibility of an experiment/theory cycle that will be able



to breach the opaqueness of the holist view of Reality. We would start with Miller's basic methodological approach, but with purely self-determining objectives. For, just as with Miller's initial effort, too much going on simultaneously will mean the the order of key processes will be unknown. So, the primary purpose in every one of an extended series of versions of the experiment, will have to, somehow, reveal particular steps, and their order.

The first addition to Miller's version had to be the inclusion of time-based sensors – taking and analysing samples regularly.

And, secondly the providing of a devised and delivered route through a succession of differing conditions.

The main purpose of such changes would be to suggest a whole series of modifications to the experiment's subsequent re-design.

There would be “wrong turnings”, for certain, but sufficient time and sequence based results would gradually allow further steps to be possible. The method would be one in which multiple modified versions would be essential to gradually sequence what probably happened in Reality over billions of Years.

So, Miller's facilities would be replicated in Version One, but “sequenced” due to a determined channel, implemented by totally unreactive barriers. And, evidence would be obtained via a series of non-invasive monitors, along these channels, taking samples at regular intervals, without in any way introducing anything into the sealed system.

But, initial results would probably be negative, for the expected processes may not have occurred, so the main conclusion would be to try again, using a similar channelled set up but different expectations and appropriate construction and sensors.

Ultimately, various uc-sequences would begin to be revealed, and the inter-experiment theoretical sessions would tackle ever more complicated questions, not only about what processes were occurring, but also, and vitally, about the sequencing to forever be moving towards the key pre-life stages.

Clearly, the most difficult questions would arise when quite separately developed sequences finally encounter one another.

And it is conceivable that some versions of the experiment might well be front-loaded with results from a previous version.

But, by far the most important questions will be about Holist experiments in general.

Dialectical Contradiction

Abstracting from reality and its consequences

As both a professional physicist and a long-time Marxist, I have a decided advantage over either a specialist physicist or a pure Marxist philosopher, for, implicitly-embodied in both of my two seriously-pursued-disciplines is the very-union which Marx both conceived-of and sought, when he abandoned Idealist Philosophy, in spite of the great contributions of Hegel, and converted to a solely Materialist Stance. A Philosophy of Thought alone was certain to be inadequate! Whatever was being revealed about concrete Reality has not only to be included too, but was surely absolutely essential in establishing an all-embracing philosophic stance.

Marx was painfully aware of the short-comings of Idealism, and the Dialectics of Hegel seemed to give him the possibility of a meaningful integration of those gains with the then other major and fast-growing alternative discipline of Science. He was aware, from Hegel's Dialectics, of both the powers and the inadequacies of Abstraction. For, such extractions-from-Reality were certainly never the "fundamental bricks-of-truth", from which a real Understanding of Reality could be built.

They did contain *some* truth, but not as any eternally-true constituent parts, but, on the contrary, involving only temporary, flawed and always modified extractions from that ultimate Truth!

For, Man-as-a-scientist usually only glimpsed regularities in Nature, and then, either chased them as they appeared, or intervened to make them much clearer, until they were capable of being extracted.

And, the consequent processes inevitably-involved, to do this, could only ever deliver both simplified and even idealised extractions - there was no alternative. To make this crystal clear, the processes that had been originally involved in establishing Mathematics, were able to deliver a considerable, if qualified, help.

In those processes, what was first essential was to simplify an observed form-or-pattern, found in Reality, to make it considerably easier to handle, and then, to modify it into an idealised version, in order to make it possible to successfully predict subsequent outcomes from an observed current state, via that idealised Form. Though definitely extracting something, it was transformed by the extraction-process into such a form!

And, the development of measurement extractions, along with the general assessment ofform, was used to encapsulate such extracted relations using algebraic symbols - usually in the form of mathematical formulae, which enabled their conversion into particular versions.

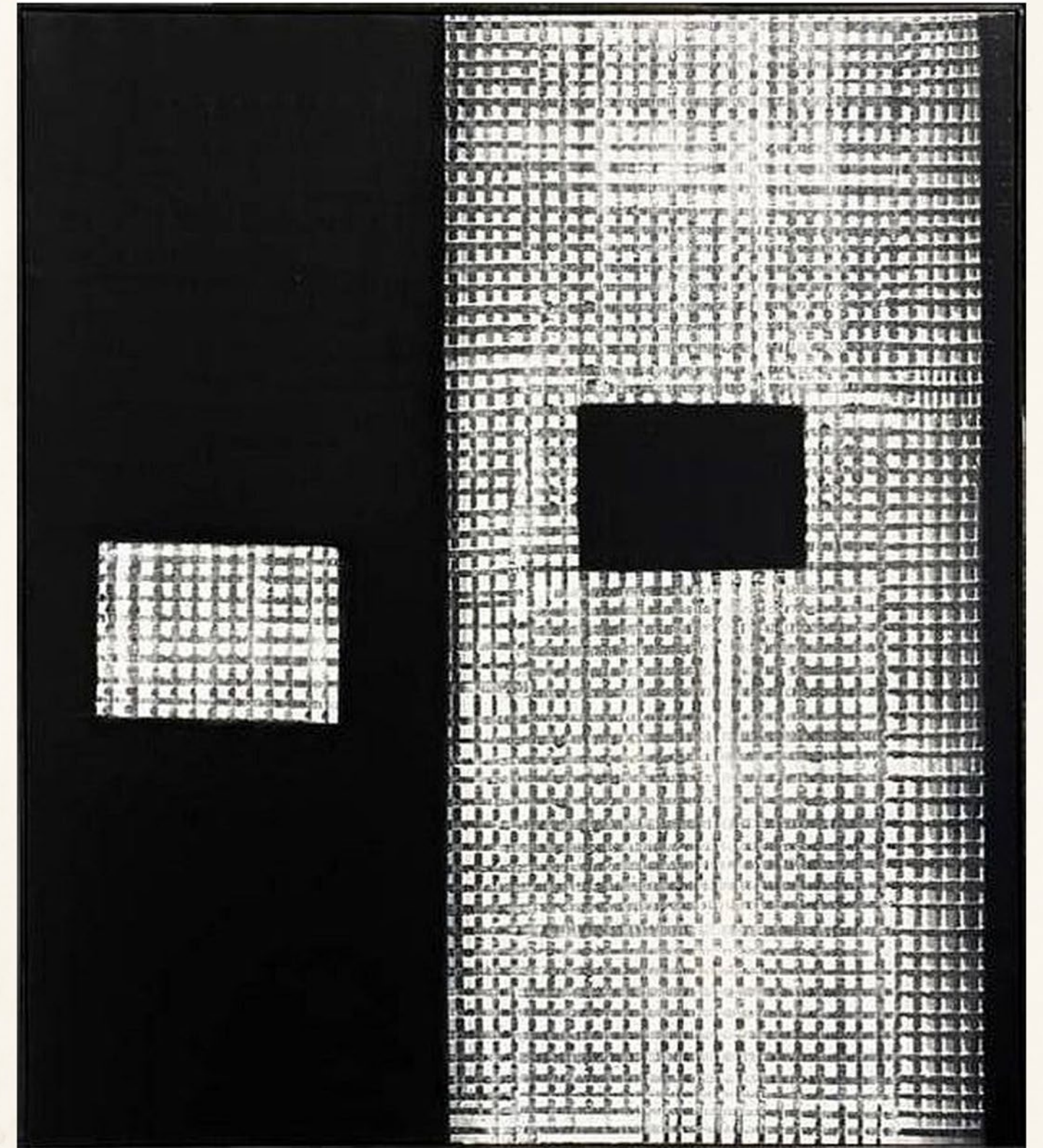
Both of the principle modifications involved - that is Simplification and Idealisation were absolutely essential to these methods. And, in appropriately-modified (or "farmed") situations, they would not only fairly-accurately represent that situation, but would also allow equally-successful predictions to be made, within it.

Yet, these achievements were theoretically-misinterpreted from the very start! It was incorrectly assumed that important eternal aspects of Reality-itself had been extracted. And, hence, if all the required extractions in an extended range of situations were achieved, then that section of Reality could be both fully described and dealt with in various useful ways. But, it wasn't true: they could not accurately do what was assumed.

Clearly, two extremely critical errors had been involved in these standard processes:

First: it wasn't Reality-as-is that had been extracted, and Second: the assumption that these "extracted primaries" were unchanged was also incorrect.

Indeed, as more recent work (by this researcher) has



revealed, it wasn't Reality that had been studied, but an unusual Subset/Superset that could be delivered by simplification and idealisation, which only appeared true, if confirmation by reference to real, unfettered Reality was purposely and rigorously avoided both in capture, and in use.

Now, pragmatically, these flaws could be dealt with, as long as situations could be rigorously limited to the required simplifying content, for then, all would be well both in prediction and in use. But, each and every extracted relation would require its OWN and different, arranged-for context, to be useable. Every Law had its necessary Context!

Yet conversely, within Thinking, an alternative "world", in which all such relations seemed to be valid, was indeed possible. This philosopher immediately labelled this cerebral, simplified and idealised world as "Ideality"! And, it was composed ONLY of descriptions in simplified and idealised contexts. Absolutely NO explanations were involved! "Conforms to this relation!", is certainly NOT an explanation!

But, even worse was to follow!

The key assumption, involved in such a stance, was that Reality is entirely composed of eternal Natural Laws, which never change, and produce complexity merely by diverse additions of varying amounts of fixed Laws.

Therefore, all the applied adjustments to investigated contexts, which had been essential to make extractions possible, could not possibly change in whatever conditions they were used within: for they were "eternal Natural Laws"!

Now, all of this depends upon the Principle of Plurality, which is certainly a Total Myth. While, it's opposite, the Principle of Holism, which insists that "Everything affects everything else!", is, certainly, much closer to the actual nature of Reality-as-is!

Now, for the debilitating clincher! The Greeks, justifiably delighted with their Mathematics and eternal Natural Laws, applied the same sort of assumptions to Reasoning, in what they termed Formal Logic: the Truth could be arrived at by using eternal Rules of Reasoning and known Factual statements, to "rigorously" derive more and more of it!

But, it isn't true! And, almost-immediately, Zeno of Elea began to unearth several clearly evident flaws concerned with the concepts of Continuity and Discreteness, both of which, and in several ways, could be shown to lead to contradiction in what appeared to be perfectly valid Reasoning.

He published them in his famous Paradoxes, but, surprisingly, no one was able to explain the problem, not only then, but also for the next 2,300 years, when Hegel revealed his Dialectics as a better general alternative to Formal Logic.

Indeed, later it became clear that the flawed methods of the Greeks, could only ever hold in Stable Situations - that is within Stabilities - whether natural or arranged-for: while whenever qualitative change was involved, either in intervals of dramatic Changes, as well as other, more gradually-drifting circumstances, Dialectics was essential!

Now, to really explain Dialectics, there is only one way - and it isn't that put forward by Hegel or any of his more recent followers. Hegel's Interpenetration of Opposites needs explaining!

Indeed, This researcher, who is both a philosopher and a physicist, has been able to explain many of the tenets of Dialectics, by reference to the concretely-existing, Physical World: indeed, and that cannot be done without Explanatory Science.

But, it is a different kind of Science from that conforming to the criticisms related above. It has to, instead, be based upon the Principle of Holism - with, of course, "Everything affecting everything else!"

The usual assumption of Random Chaos, as a starting point in our Universe, must be dumped as either a simplification or an idealisation, or BOTH!

Clearly, for any real, self-moving development to take place, the better assumption must be based upon the inevitable interactions - not only involving physical collisions, but also mutual-orbitings (as in all atoms), and in hierarchies of chemical reactions producing various different compounds - within constant movement and mixing.

What then would be likely to happen?

Clearly, both associations and dissociations would be unavoidable, as would the very-same-resources being required by different chemical reactions.

There would then most certainly be a non-living form of Competition, which, unlike the fabled Random Chance scenario, would be different in different localities - depending upon the temporary-local-preponderances of certain resources over others.

A Muse on Competition

Let us first define our terms! Let us consider a region comprised of several reactive substances with a single one of these dominant due to some prior situation. The commonest processes that will primarily ensue will be those involving that predominant substance. Several may be possible, but beyond the primary processes further reactions of their products will follow, also involving other non-dominant substances, as well as secondary and further products produced. And, the progress of the consequent overall process will depend upon how these secondary and tertiary processes use what is available! Of the primary dominant sequences there will be TWO that gradually vie-to-dominate - First the one that which was dominant from the outset, and Second the one which required the-very-least of substances required by the secondary and tertiary processes delivered by the First. Thus the two most dominant will tend to be Opposites as their subsequent requirements have very least in common!

In such circumstances the favoured set of reactions would act - producing their consequent products far faster than any other reactions, and hence producing, as a result, yet another preponderance - that of their products.

Also, and very importantly, if two processes came together where one used the other's product, as its necessary resource, a kind of linkage could develop - particularly when involving preponderant substances, and related preponderant processes.

Very quickly, without any other reasons at all, certain Dominances could grow exponentially, So, apart from totally unrelated processes, there could be a Selection of Opposites, above the irrelevances of the rest.

And, the balance between them could be with one or the other winning, or at various states between those extremes.

And, as in all holistic situations, these conditions might for a time persist in one extreme - a Stability, only later to be undermined and even by replaced by its opposite - in the consequent Emergence of yet another Stability!

The Ground for Dialectics in a Holist World is established!

Now, the reader must excuse this unavoidably cursory description: the writer is aware of its inadequacies, but convinced that not only could a fully coherent system be ultimately described, BUT also, and crucially, that whole complex set of changes be arranged-for in a suitably-designed Experiment (similar to his proposed re-design of Miller's Experiment, but with each succeeding version designed, primarily, to deliver a better version in the next attempt: a holistic form of experiment, if you will?)



The Significance of Oscillation

to the Nature of Reality

Our first conception of Reality was always bound to be of its human-scale entities, eminently stable and persisting forms, processes and products. For what actually exists, at greatly smaller levels, is entirely unavailable to our senses, and because such knowledge did not inform our prosperity and survival, such as is implicit in the “our-scale” things we need and use to survive or even to prosper.

But, what are those larger-scale seeming permanencies? Are they really as permanent as they appear to be? No, they are not! Indeed, the more we investigate them, the more frequently do we encounter much smaller-scale components, which are all in persisting oscillation.

Clearly, opposing effects are simultaneously effecting things, which find some sort of persisting balance in oscillation! We can see less permanent versions of similar oscillations, even at our own macro level, in the vibrations of strings, and even in those of many rigid things, but they soon lose energy to the surrounding atmosphere, and fade away.

The clearly evident vibrations, at our level, are always transient...

What are far more important, are the oscillations at the micro level, which do seem to persist indefinitely, without ever fading away! And, by far the most important form of such oscillations is the orbiting of one body around another, which can be “permanent”, and actually exist at every level from the Sub Atomic to the Cosmic.

Various explanations of these orbitings, some of which can last for billions of years, have been suggested, The Cosmic persistences being said to be due to their happening in a vacuum, so there is nothing to carry away the involved energy. While, at the other extreme, in the oscillations of atoms in solids, are said to be actually

maintained by the ambient-temperature energy of the surroundings, in intimate contact with the oscillating atoms.

But, what about those orbiting electrons within atoms?

They can be both promoted and demoted, from-and-to external energy sources, BUT NOT in a continuously-changing way: the orbits only exist at particular radii - all others are prohibited (the famed quantisation of orbits).

But, these same properties also persist in the supposed vacuum of Space!

Now, similarly “quantized” orbitings have been created, in the laboratory, and at the macro level, when deliberately made to occur in a liquid Substrate, under surprisingly simple conditions. Now, before anyone gets too excited, may I inform any doubters that ALL that was involved in these experiments was a single silicone oil substrate, and absolutely nothing else!

They were carried out by French physicist Yves Couder: and the writer of this paper has concluded that some of the remarkable phenomena produced there, in particular the orbitings of the produced “Walker entities”, were made possible entirely by the presence of Vortices generated within the Substrate, and both maintained and even quantized by the two-way transfers of energy, between such a causing orbit and its produced vortices, due entirely to the constantly repeated orbits, only balancing-out to stability at particular orbit radii!

The significance of this, if true, will be enormous! For, this theorist has already applied these ideas to the quantized orbits in atoms, and also has explained all of the anomalies of the Double Slit Experiments, primarily by the presence of a currently undetectable Universal Substrate.

The Copenhagen Interpretation of Quantum Theory is now already mortally wounded! And, many of the inexplicable properties of "Empty Space" are also receiving physical explanations, in terms of this same currently undetectable Substrate.

And, that Universal Substrate isn't just an unsupported speculation, without a detailed explanation of its composition, that too is well under the way, and currently holding up very well.

Though this may be dismissed as unsupported speculation, I have to strongly demur - especially when the alternative, the Copenhagen stance, isn't even a Theory, but merely a formal description, bolstered by a remarkable series of speculations!

No indeed. I take my methods from those of James Clerk Maxwell, who, seeking an explanation of the then also currently undetectable Universal Substrate - The Ether - devised a purely theoretical Analogistic Model, composed of Vortices and "electrical particles", to explain the functions of that substrate, and from it managed to develop his world famous Electromagnetic Equations! He was using the only means available to the investigator deprived of sufficient access to what he required to address a given problem. He knew, very well, that our theories, at best, only ever reflect the amount of Objective Content in our explanations, and that they would inevitably be replaced by others, containing more of that Objective Content thereafter.

So, theories, which explained more than those they replaced, were entirely legitimate in maintaining the necessary ongoing ascent. But, wild speculation was still prohibited - no Gods here!

Instead, the sincere investigator would seek analogues elsewhere in Reality that were already to some valid extent understood, and attempt to weave an effective explanation out of those - That is what is being done here. That is the postulation of a currently undetectable Universal Substrate, using everything we know about "Empty Space", and as many analogues from known and detectable substrates as possible.

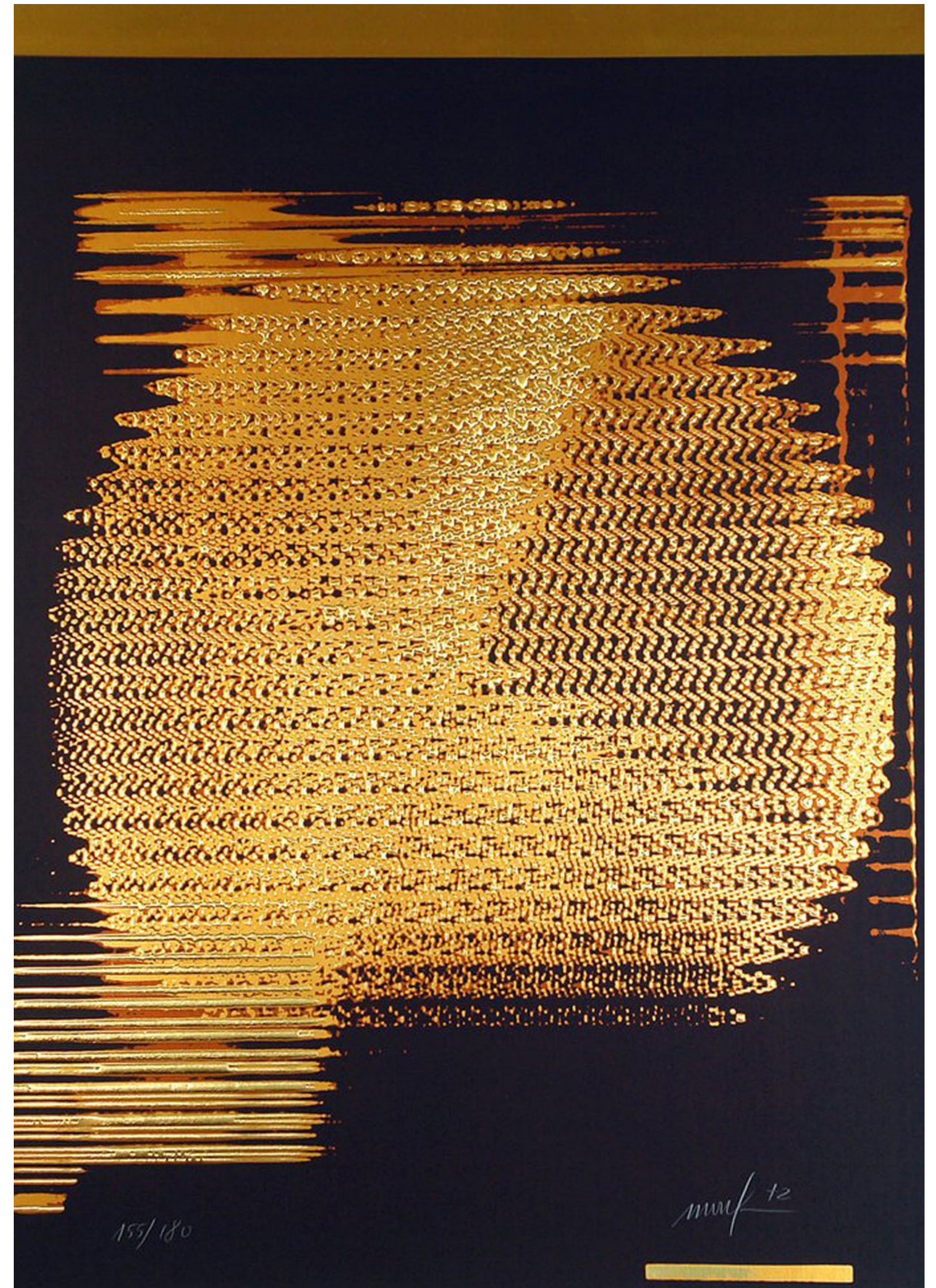
Clearly, if validly established, the universal presence of a material, yet hidden Substrate, will undermine many assumptions in current physical theories.

And, the first giant Sequoia to fall will be the Copenhagen Interpretation of Quantum Theory.

While the next must be all of those that insist upon totally Empty Space, anywhere!

For, with the kind of Universal Substrate that has been developed to demolish Copenhagen, a rich background for literally all phenomena has been established, and, crucially the supposed cause of Quantization becomes a generally possible physical ground, occurring everywhere.

Add to this the increasing role of both oscillations and orbitings, and their intrinsic participation in interactions with that Substrate, and a whole new approach at all scales becomes crucial.





Music and Holism

A gateway to the full richness of reality?

As soon as you consider the consequences of a Holistic World, the possibilities as compared with the usual strictly Pluralist standpoint actually explode dramatically into a host of new possibilities - not only into myriads of previously unconsidered alternatives, but also into the effects of sliding amounts of different components in all compound entities and processes, but crucially, in addition, into also including both rich joint interference patterns, and, in gradually varying mixes of different components, even how they produced consequent combined, mutually affecting, and sometimes, significantly, wholly unpredictable results.

Mere quantity changes are expanded into changing qualities, and even the emergent production of the wholly new! The traditional pluralist approach cannot deal with such in any meaningful way: we just have to accept them and find pragmatic ways of including them.

Only the holistic approach admits there is more than mere complication in the emergence of the new, and it isn't a purely continuous process: sometimes it requires a major dissolution to even make possible a new direction of developments. And as, distinct from the old conceptions causality can act in both directions = from the old to the new, and from the new to the old. What is actually possible leaves the usual assumed combinations of fixed entities and eternal Laws well behind, on the foreshores of the Pluralist World: the majority of the vast oceans of the Holist World remain to be explored!

Now, perhaps surprisingly, the cornerstones all of Mankind's effective intellectual disciplines, ever since the Ancient Greeks, have been entirely dominated by the Principle of Plurality - a definition of the "nature of things" that always treated them all as qualitatively-fixed, which had originally been applied to the shapes of things, and related all existing shapes to combinations of individual Perfect Forms, that is as mere additions

of various amounts of several of those always-the-same components. Indeed, the following major successes with such Shapes, enabled not only the construction of a powerful means of dealing with Forms in general, via Mathematics, but, was also exported to form the basis of a new reasoning with Statements of Fact, termed Formal Logic! And, within a generation, was also extended to the early attempts at Science.

Now, elsewhere, by this theorist, this has been rigorously contended as totally ignoring all Qualitative Change, and even the indisputable Evolution of things in a trajectory of qualitative developments.

For, absolutely nothing in nature is a mere Legoland-like constructional puzzle!

Clearly, the diametrically opposite Principle of Holism, with its tenet, "Everything affects everything else!" has to be much closer to the Truth, yet it hasn't been comprehensively applied to any of Mankind's Intellectual Disciplines, thus far! But, the flaws of Plurality have long been known, though never recognised as such.

The best early critique was formulated by Hegel, and converted from his idealist approach to a strictly Materialist one by Karl Marx. Yet, a comprehensive application to Physics has never yet been attempted.

Now, this is currently underway by the writer of this paper, but within his other interests, it rapidly became clear that the most appropriate area for a truly Holist Approach to be both demonstrated and even developed, just had to be in Music, and especially in Electronic Music!

After centuries of pluralistic structures in Music, particularly in the West, the forms began to "break the rules", though in a remarkable way still using instruments

actually constructed to deliver the old pluralist scales. Yet, certain stringed instruments, without-frets, did allow portamento - sliding between "legal notes". And, an increasing awareness of Oriental music, (particularly that of India) revealed a much richer sonic world, with instruments expressly designed to make portamento an integral part of the artistic expression.

But in the 1960s the musical experimenters using tape loops and early electronic musical instruments, such as those used by Terry Riley with his "In C", also extended the variations to a much wider set of changes, initially at least, NOT totally under the control of the players.

Like the fractal mathematicians watching their constructions, produced by algorithms on computers, generated ever more unpredictable forms, so the musicians did likewise with combined cyclic sounds and very slowly indeed reflected another aspect of Reality.

And, in Physics, the French physicist Yves Couder, focussed primarily upon the properties of liquid media, devised analogistic experiments at the macro level, using a liquid substrate, and absolutely nothing else, to produce persisting entities called Walkers, which began to reveal qualities analogous to those occurring at the Sub Atomic level, including quantised orbits.

Now, those may not seem to be related to our thesis here, but they are!

The Holist approach is much closer to natural Reality than Plurality, especially when phenomena occur in a Universal effectible and affecting Substrate. And, by far the most controllable discipline involving its propagation and receipt via a medium is MUSIC!

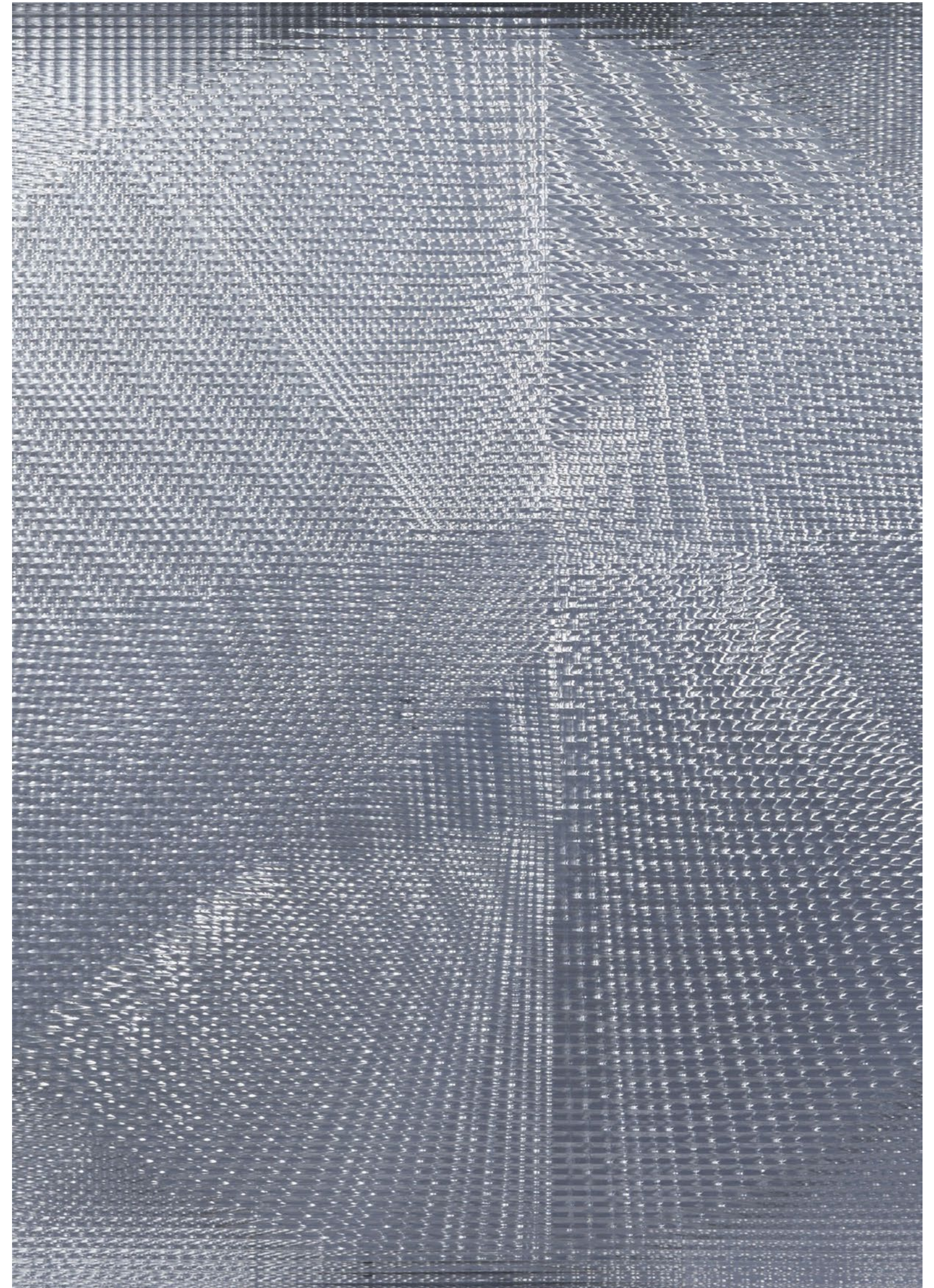
And, it has the property of being directly receiveable by the senses of human beings, especially those with a musical bent. This enables not only the discovery of the wholly new, but when the very instruments of production are directly under the investigators hands, variations can be made to listened to examples explored with immediate and direct feedback.

Now, Terry Riley and his colleagues were performing musicians rather than scientific investigators, so they were making primarily artistic decisions, as to exactly when they came in with their contributions. But, that meant that they did not have a complete idea as to how

their contribution would affect the following overall piece.

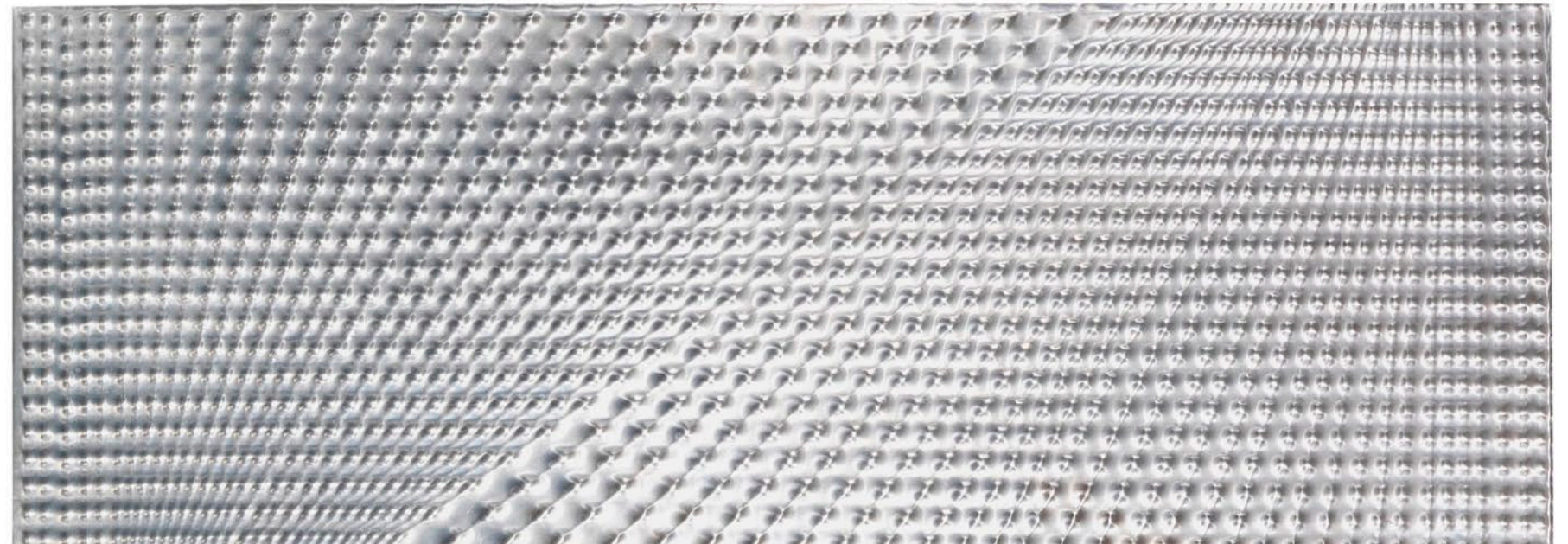
Other performers since, playing the same "In C", decided to have a random number generator choosing when the various contributions would be added - you could just as easily have scientists choosing when to bring in certain elements to achieve certain sonic effects. Clearly all three versions would be different, and reveal different "music"! But there can be no doubt that such investigations would go beyond what the more usual kinds of music would deliver.

More on this idea soon...



Holist

Contexts



In considering new kinds of substrates with contained phenomena happening within them at various diverse levels, indeed, all the way from the Cosmic down to the Sub Atomic, and especially if they are currently undetectable, for then an interesting set of “alternative worlds” begins to emerge. It unavoidably has to involve the consideration of their effects upon the movements of diverse intervening bodies, instead of unrestricted passages through totally Empty Space - from planets all the way down to “elementary” particles.

So we have to, perhaps before all else, tackle both the possible speeds and intrinsic modes and phenomena of those substrates themselves also! NOTE: See Yves Couder’s Walker Experiments for good reasons why this is necessary.

Now, such substrates can, as a whole, appear static, while actually being composed of fast, randomly-moving units, which can, on the one hand, effectively cancel-out their individual movements, while on the other, still be quite separately involved, as a whole, in an overall drift, in a given direction, due to other external causes.

And, in addition, the relationships between traversing bodies travelling through, and the composing units of such a Substrate, can work both ways, and even result in caused changes in the substrate units, and their later reacting back upon their supposed causes.

So, if the reader is wondering why such an undertaking is considered necessary, I should perhaps clarify that such questions emanate from a truly Holist view of Reality, in contrast to the usual consensus pluralist view. Let us see where such a stance can lead!

Indeed, perhaps the most surprising cases occur when bodies are passing through a loosely-associated substrate of units, for they can cause them to be dissociated into individual, free-moving forms, that can then form into driven-streams and even vortices. If such disturbances are not simple passages-through, but are, instead, actually established as constantly-recurring phenomena, returning time-after-time over the exact same pathways, such as could be the case with orbiting electrons in atoms, for example, then other even more surprising phenomena can become established.

This theorist has already considered a series of totally undetectable substrates, all of which, nevertheless, are both affectable-by, and effecting-of, alien interlopers traversing through them.

They range from a Neutrino-only substrate, forming a loosely-linked Paving (responsible for propagating EM radiation), which is both easily dissociated into freely-moving units in streams or vortices, yet also just as easily re-constituted into a Paving again, soon after any causing-disturbance has passed.

But also, we can go on to yet another, this time a Magneton Substrate, which normally produces a very different undetectable medium, but this time delivered by equal numbers of mirror-image particles with opposite Magnetic Dipole Moments which cancel out due to incessant random motion-and-orientations of the substrate components involved. Yet, which in the presence of a charged particle intruder, surround it with re-orientated magnetic moments in concentric shells - producing what acts exactly like an Electrical Field. While also, it can, in an externally applied magnetic field, link up into multiple Magnetic lines of force.

Now, the reader will not have missed the Major Omission in this account! It is of course the actual compositions of these various substrates: what are they actually composed of, and why have they not been detected and studied elsewhere?

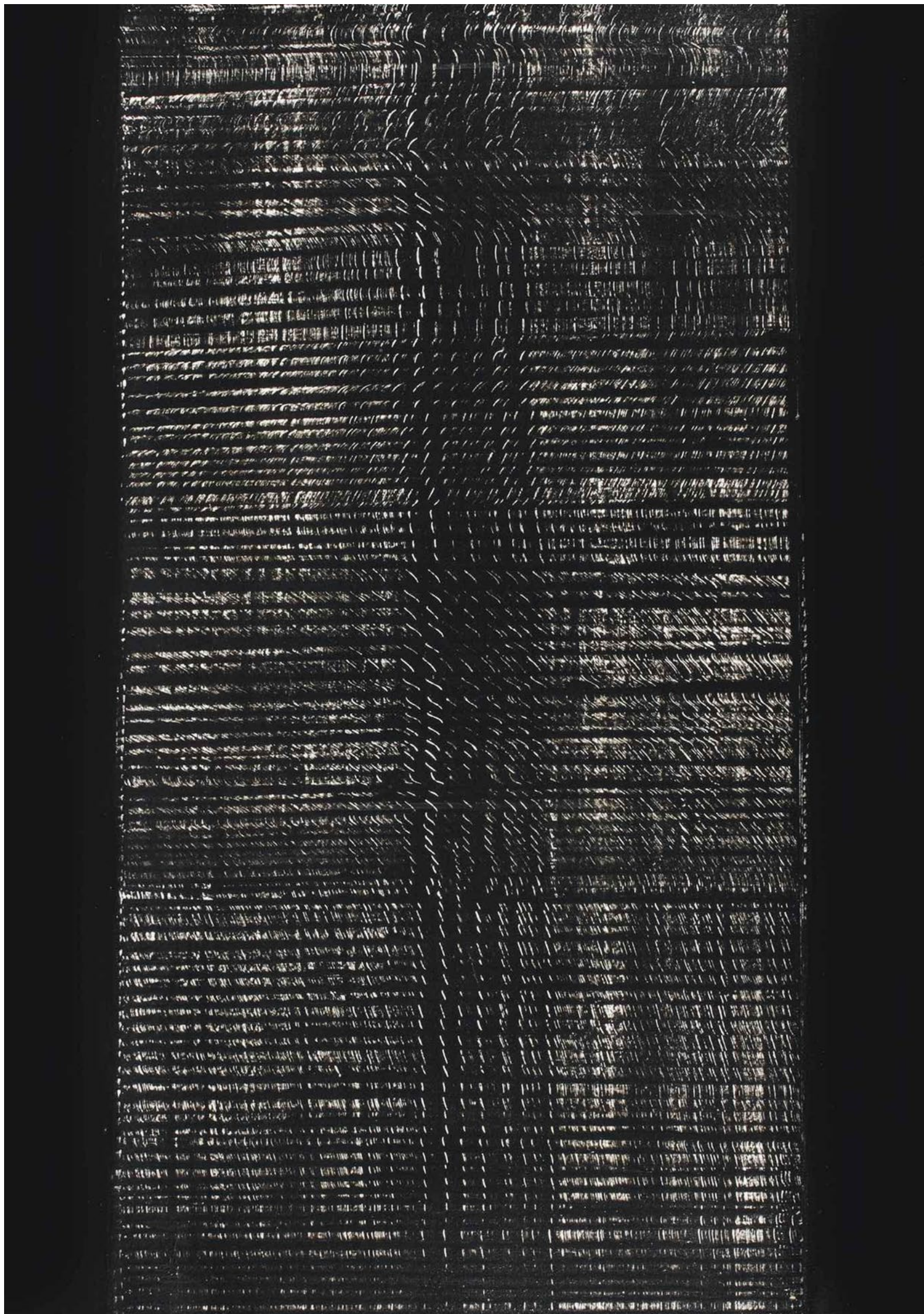
Well, all such questions have been addressed - at least theoretically. But, before entering into such an involved discussion, I thought it absolutely necessary to establish, theoretically, the exciting potential of the holist stance in such an investigation. For, it is usually dismissed as an oriental, religious view, totally un-implementable in the hard sciences such as Physics. And, not only is that untrue, but in insisting upon the consensus pluralist view, which has dominated in most intellectual endeavours since the contributions of the Ancient Greeks, it not only led to the Impasses of Dichotomous

Pairs of contradictory concepts, that abound in all such disciplines (and crucially in the reasoning employed via a clearly flawed Formal Logic [see Hegel’s criticisms]), but have also made impossible the constructive addressing of the mess that is contemporary Sub Atomic Physics.

Indeed, elsewhere, the holist alternative has led to a dismissing of all the anomalies in the Double Slit Experiments, without any recourse to the Copenhagen Interpretation, as well as many other similar dead ends.

See also by this author:

The Theory of Emergences,
The Theory of the Double Slit,
The Atom and the Substrate,
Quantum Disentanglement.



The Holistic

Propagation of Fields

There is a consensus set of assumptions about fields that betray major flaws in our key premises with regard to Science as a whole.

We incorrectly believe that natural phenomena are actually *caused* by Natural Laws, which are, in turn, accurately embodied in certain equations that, as a whole remarkably, cover all possible cases that could occur. But, it just isn't true!

Elsewhere, this researcher has proved, beyond any reasonable doubt, that our trusted equations are incorrect - for they cover only the exactly selected-for, and then significantly purposely-farmed, situations, from which we were able to extract them. And, even more serious, is the establishment of these equations (Natural Laws) as the presumed sole-drivers of all Reality. They are certainly not that, and, to believe that they are, reveals an undeniably idealist standpoint - entirely inappropriate when dealing with concrete Reality.

You may wonder how such a stance could ever have possibly happened, but such Laws, in appropriate contexts, are used every single day, in production, with undoubted success, so Pragmatism is most probably the main justification. Yet, even that latter point is easily dealt with. The laws work because they are *ONLY* used within exactly the same conditions from which they were originally extracted.

But, it is also the assumption that they are the *eternal* Natural Laws, applicable in all conditions, and when used in subsequent theoretical developments, that turns out to be even worse, and significantly and profoundly misleading! In order to cope with complex Reality, Mankind always farms all experimental contexts, to more easily display targeted relations. The Large Hadron Collider is certainly one such farm!

But then, to avoid the difficulties that this kind of farming always caused, they decided upon a Principle that made our assumptions appear to hold up as valid. It was, of course, the defining and justifying Principle of Plurality. But, Reality at large is certainly its exact opposite - that is, it conforms, much more closely to the opposing Principle of Holism.

Plurality, as a basic rule, allowed all our assumptions to hold, logically, but it isn't true: it allows only simplified and idealised abstract forms to be achieved, which can only be used in carefully tailored and maintained artificial contexts, but are never true in totally unfettered Natural Reality.

So, here begineth a very different approach, indeed, which admits of the holistic nature of Reality, and attempts to develop experimental and theoretical means to deal with it.

It is much more difficult than the pluralist approach, but it addresses something far closer to unfettered and evolving Reality. This work forms part of a major attempt to both define and establish A Holistic Science.

Various complex phenomena have already been tackled successfully - such as the anomalous Double Slit Experiments, resulting in a physical explanation without any recourse to Wave/Particle Duality, with absolutely no Superposition, or any so-called Quantum Entanglement! So, you can see why the more general approach has now to be developed.

But here, we will be concerned, exclusively, with Fields!

Such as why the supposed effects of fields stretch over such colossal distances in Cosmology, for example, where fields like Gravity effect things across the Universe.

This has to be the place to start (as it was historically, with Isaac Newton), because, unusually, in so-called Empty Space, there is sufficient isolation for the extracted pluralist laws to actually be irrefutable. So, we will be starting in the very places where the prior pluralist approach rules OK!

But, and it is a very big BUT, how do these gravitational effects get established, and have sufficient energy to actually affect celestial objects of all kinds and sizes, and over truly enormous distances?

For, the supposedly-causing bodies are totally undiminished by the gravitational forces that they presumably exert! How does the gravitational field get built and how is it even maintained, throughout all changes, and where does the evident, exerted energy come from? We have already said that it doesn't come from the "causing body".

Now, Einstein got around this with his suggestion of a distortable Space/Time Continuum – but that is just another purely formal descriptive construct. A clever trick to paper over our ignorance! To explain it *physically* MUST involve some form of medium or substrate, otherwise the causalities involved are either magic or totally idealist.

Let us attempt an alternative physical description, and consequent explanation of Reality!

Taking any standard field, with an inverse square law, then the size of the field at any point (as we move further and further away from its supposed cause, will dramatically reduce, as the distances get larger and larger. Indeed, every single point, surrounding that source, out to truly vast distances, must be affected, for any interloper into any position, will, without any doubt, be affected in its trajectory by that field, wherever its position.

NOTE: only one natural feature, surrounding an "affecting gravitational source" would supply an inverse square law effect, and that would only be the case if the units of a substrate shared that effect in a series of concentric shells surrounding it - for the successive shells' volumes, and hence capacities, would be in an inverse ratio of the squares of their distances from the source.

Now, the deposition of active, useable energy, throughout that vast volume, especially as the presumed source

has been in no way diminished, more or less demands that the necessary energy was already there, within the units of a universal substrate, but has been re-directed to become available energy throughout the field, by the mere presence of the presumed source. Both the energy involved, and the action caused, must be down entirely to the substrate! Somehow, a message must have been generated, within the local substrate all-around that "presumed source", which naturally propagated-a-change in substrate structure, outwards, from that "source", and with an effect towards that source.

In other words the substrate is, even here, a propagating medium. But, as the effect is distributed to an ever larger volume of surrounding substrate, it, naturally, becomes diminished - geometrically determined by the increasing number of spherical shells of substrate units involved – with the shells' surface areas governed by $4\pi r^2$.

The very same would be true for Electric Fields, as the charge upon the supposed "causing object" is in no way diminished by establishment of the field, or by the actions that the field then causes. It could only be that the substrate, itself, has reacted by its own distortions flowing outwards via the immediately adjacent units of the substrate, which, thereafter, naturally propagate the same changes outwards, but to more and more units, and with less effects, as explained above.

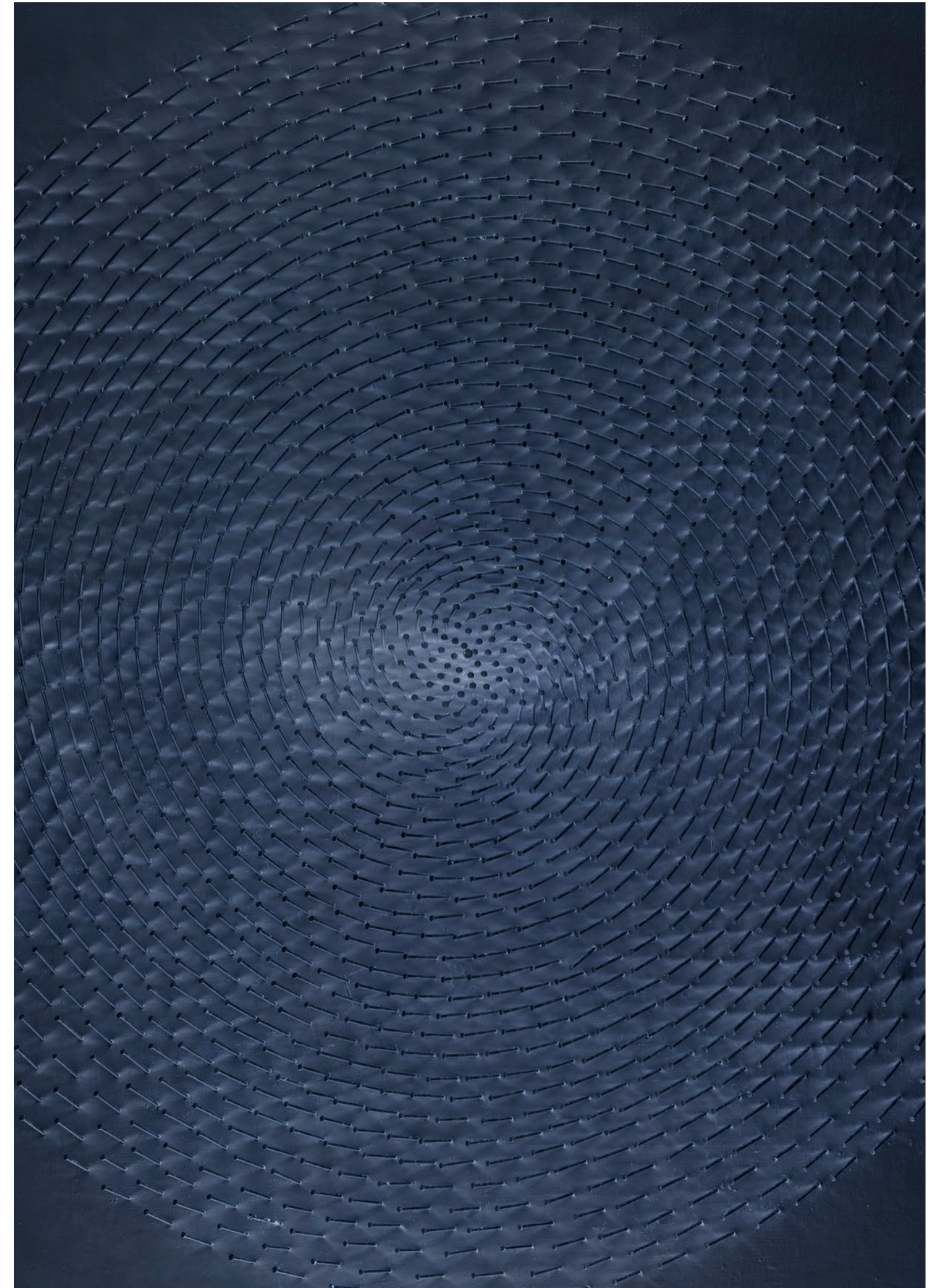
Initially, in this re-organisation, no changes are made to the units, except for their orientations. Thereafter, the once totally-cancelling-effects, in a random, constantly-moving arrangement, now have become available in statically-aligned, and hence directed ways, simply by the lined-up orientations, of the units involved. The results of these effects, however, from over a general whole volume, must be local to any particular affected body.

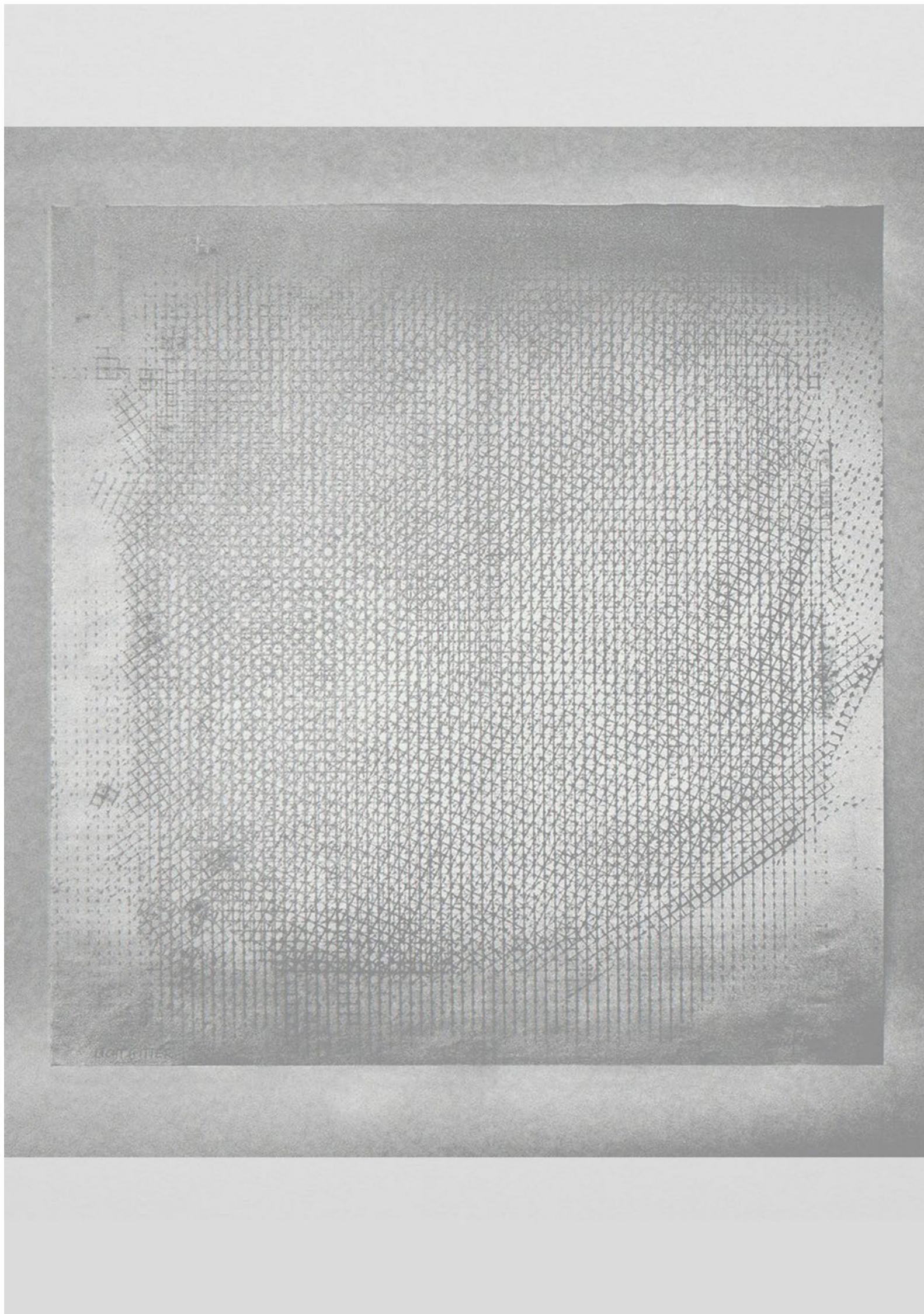
And, this must be the case for several sound reasons.

Reason one: Direction.

Somehow, the actual states of the substrate units, across the whole field, in the vicinity of an affected object, is the only way that any affect of sufficient size and direction could be made available.

For, different positions (units of a substrate) will have different directions to the "causing" source, and, if all units of a local region are affecting the body, they will





together, deliver enough to both indicate direction and provide sufficient force to affect any subsequent trajectory too! Also, any interloping, affected body will suffer a force, which will redirect it. Remember, no diminution of the supposed-and-initiating source of the effect (that which supposedly generated the field), will occur, so the energy involved can only be supported from local to the position of the affected body, and sufficient to affect it! So, that necessary energy MUST come, not from a single unit of the substrate, but from a significant penumbra of the substrate units surrounding the affected object! [In fact, that object, itself, will have had its own affect upon the substrate, perhaps re-defining that penumbra]

NOTE: It is suggested that, normally, the units of the substrate are not empty of available energy, but always have some situated internally, in the promotion of the contained mutual orbitings (similar to the atom), and that once so diminished by affecting the interloper, they are automatically replenished by the rest of the universal substrate, generally.

If the distances to the source are colossal, then the above reasoning will no longer be entirely true. All unit cells will indicate the same direction, so no actual orbit will yet have been established – merely a directional deviation. It will be nothing more than that until sufficiently different directional effects, over more points, have been experienced, all with different orientations to that “source”.

And, the consequent significance of all this is, indeed, profound!

It cannot be an abstract equation determining its orbit, but this succession of positions. For, such an equation is, quite clearly, both a simplification and an idealisation of data, massaged or fitted to a pure, abstract form, taken from the mathematicians, and tailored to fit farmed data for pragmatic uses. It cannot *cause* a real world phenomenon: it is a man-made abstraction of a real, concrete phenomenon. The actual cause must be both holistic and concrete, NOT pluralistic and formal.

In other words, the actual causality is more iterative and real than formal, abstract and “overall”! Any equation will only finally be possible to fit, after sufficient positions have been traversed, and even then it will NOT be absolutely true, as all differing effects upon it will change it further.

Perhaps the most significant feature of a real, holistic factor, is that the effect, once produced, introduces something new to the causing situation. For, we can get *Recursion*. And, with such, there can be converging changes, which establish a stability, but, there can also be diverging change, which invariably leads to the exact opposite – collapse or even chaos!

This should be related to the work on Mathematical Chaos and Iterative formulae, researched elsewhere with very different purposes to here, where they are actually inverted. For, in these considerations, NO pre-existing, iterative formulae will be available. On the contrary, we will have only the experience of different real positions (due to whatever is causing them) - experience that will define NOT the usual formal equation (for the entire orbit), BUT, instead, a changing iterative form that could allow successive points to be derived from all prior points. It will be different from the usual types of iterative forms, which are developed from the full orbital equations. Here we are deriving such iterative forms physically “as-we-go”.

It will, indeed, be interesting to see how such an “iterative form” is constantly emerging from a succession of real points. For we are used to the exact opposite, where a succession of predicted points emerge directly from a single point and repeated applications of a fixed-iterative-formula.

Propagating Fields

We will also have to explain just how such a field could be the concrete result – built up from the presence of a “causing source” For, it could only be some kind of ongoing process! It would not just appear instantly at all the possible affected places.

Quantity into Quality

Pluralist and Holistic

One of the “myths” of Dialectics is the tenet “Quantity into Quality”, but stated baldly, via such a phrase, it in no way includes why-and-how such a transition takes place, and whether it is constantly occurring, or happening only in special circumstances. So, stated as such, this tenet seems incapable of making any sort of profound contribution.

Taken exactly as it is stated, it could be a permanent feature of a single state: which increases quantitatively until it reaches a threshold, and thereafter becomes something *qualitatively* different - like increasing the temperature of a solid until it melts, or doing the same to a liquid until it boils into a gas!

It is clearly, when in that given form, currently-descriptive rather than generally-explanatory.

And also clearly, there is insufficient information given to be able to predict *when* it should happen (except of course via the old purely pragmatic way of watching until it does), and noting the temperature, which you then remember: and, even then it only describes rather than explains.

We could continue further, though still-pluralistically, by assuming the current state is determined by many contributing factors, which merely sum, to deliver the particular, overall state, by keeping it as such, until enough of them are quantitatively increased, they could change what dominates to deliver a different sum, or become more and more disruptive, and acting against the current state, so that it in some way dissociates.

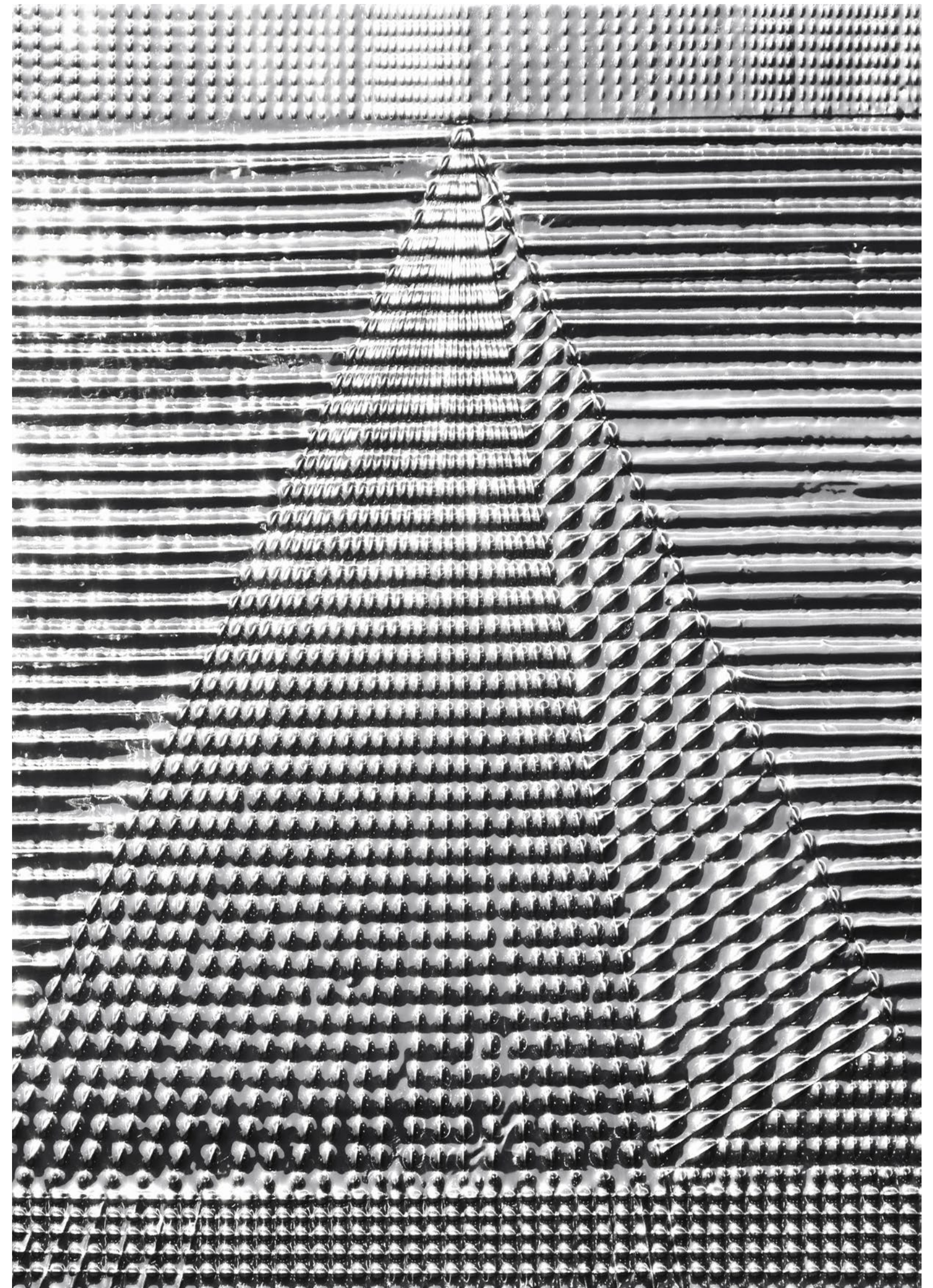
Absolutely no qualitative change in the contributing components is assumed, purely quantitative only, but once again, it doesn't *explain* things. It is still wholly descriptive!

What could it mean if we attempt to see such a state holistically?

Again, we can have a collection of components seemingly contributing to a given state, but here “Everything affects everything else”, so changes in any of them will affect the others too, plus vice versa, and in their overall combined effects as well. AND, this will be happening all-the-time, so, for an overall quality to be retained, it can only mean that its stability is due to a cancelling out between the many contributors, so no overall quality change occurs.

But, ultimately, the seemingly maintained balance may instead be compromised, so the overall stability could be lost. And then, all sorts of qualitative changes could then ensue, including the possibility of some new-and-different stability being re-established, due to a new balance of now different contributions. With such a transformation, we are certainly a long way from what was delivered in the bald tenet, are we not?

Indeed, the crucial differences between the usual ways of explaining phenomena and these new ways are best illustrated by the terms “Pluralistic” and “Holistic”, because they allow the construction of wholly different worlds! And Plurality was the unavoidable necessary Principle, to legitimise the first, and still widely dominant assumptions about the Nature of Reality. For, it was seen as the mere sum of various natural contributions - a Legoland conception of the universe! And, for this to work the logical “lego bricks” had to be eternal Natural Laws! These would be unchanging contributions that simply summed in various amounts to deliver everything that exists! Such components varied only quantitatively, from zero to some upper limit. And, it did seem to work in static situations, but was useless when qualitative changes were involved.





Indeed, the whole of a fast developing Early Science, could only deliver anything useable if the conditions were not only “held still” while investigating a situations, but also maintained as exactly-the-same during use!

Now, this was clearly a distorted, even etiolated growth: it laid down narrow pathways through Reality, delivering useful, practical things as it went, but was pragmatic eather than explanatory.

But, it dud expose a great deal more than its predecessor - the purely pragmatic “If it works, it is right!” ever could. So, it lnevitably caused many to ask, “Why?” throughout, and they could only address that key question with a very different stance!

They had to consider what were involved, and what properties they had, which might explain what clearly occurred. They thought instead of causes-and-effects, and they did their thinking qualitatively, for the big problems were precisely where the pluralist approach failed.

What were totally inexplicable pluralistically, were often obvious in terms of causes and effects, especially when conflicting-and-changing causes were involved. An alternative holist accompanying narrative began to emerge alongside the pluralist laws! And, any conflicts between the two were pragmatically overcome with the still ever-present -”If it works, it is right!” It certainly wasn’t yet a consistent, coherent and comprehensive approach!

But “Quantity into Quality” could only be a holist concept! Exactly how it worked was only generally appreciated so far, and detailed explanations in all the different cases, when it applied, would also have to be delivered!

But, even the Holist version of this tenet, by Hegel, does not exhaust the concept, for Marx transferred all of Hegel’s Dialectics, wholesale, into an all-embracing Materialist Philosophical Stance, and developed it much further, which came to fruition only in the 21st century with Schofield’s *Theory of Emergences* (2010)



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